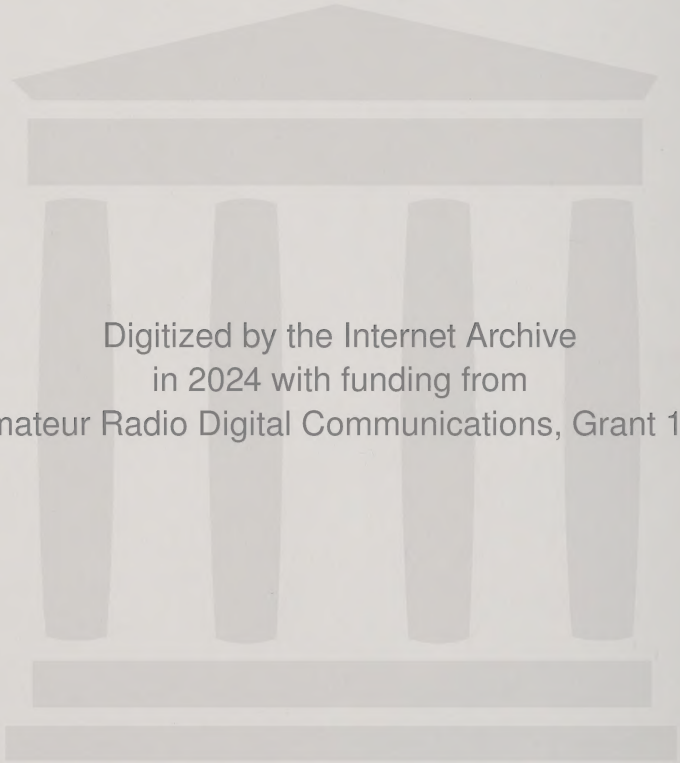
Pioneer Tales

From Cable TV History

Archer S. Taylor



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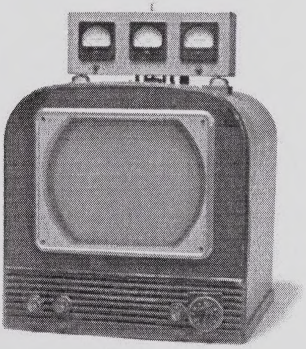

Archer S. Taylor

THE CABLECENTER
EDUCATION AND INFORMATION RESOURCES

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ISBN 0-9763412-0-4

THE CABLE CENTER
EDUCATION AND INFORMATION RESOURCES

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PREFACE

Pioneer Tales From Cable TV History is a companion to *History Between Their Ears* by the same author, published in the year 2000 by The Cable Center in Denver. The first book embraces the recollections of pioneer engineers and technicians engaged primarily in developing, virtually without precedent, the technology, manufacture, and supply of the specialized equipment required for community antenna television (CATV) systems, now known as Cable TV. The present volume supplements the story with recollections of some of the intrepid pioneer entrepreneurs who first introduced CATV, in small towns and cities in the United States, as a business they hoped would become profitable, as it most certainly did.

Undaunted by the many potential disasters lurking around every corner, these pioneers encountered not only the blank stares of bewildered bankers, but also the hysterical complaints of broadcasters, the paranoia of TV dealers, and the jealous hostility of telephone companies. The only friends they had seemed to be their customers. With grit and determination, they circled their wagons around the National Community Television Association (NCTA) and together confronted hostile legislation, oppressive regulation, and lawsuits aimed at their extermination.

The *Pioneer Tales* are more about creative financing, vigorous lobbying, and brilliant litigation strategy than about applied technology. Like the earlier book, *Pioneer Tales From Cable TV History* is based on transcripts of Oral History interviews conducted under the auspices of The Cable Center (formerly the National Cable Television Center and Museum), now located on the campus of the University of Denver in Colorado. The stories of these pioneers are told mostly in their own words, extracted from their Oral Histories. Transcripts of more than 100 Oral History interviews are available on the Internet at www.cablecenter.org. Browsing through these transcripts will reward the reader with many additional stories and insights about these and other pioneers, as well as leaders in the exciting and more recent developments in cable television.

Many of these pioneers were products of the Great Depression, experienced in surviving hardship, some with help from the Civilian Conservation Corps or the Works Progress Administration. Many received training in—or were exposed to—radio or radar electronics as part of their military experience during World War II.

The trade association organized by Martin Malarkey about 1951 was originally named the National Community Television Council. At the urgent recommendation of attorney E. Stratford Smith, the name was quickly changed from council to association and was formally established on January 28, 1952, as the National Community Television Association. In 1967, the name was changed by vote of the membership to the National *Cable* Television Association reflecting the changing focus of the industry to include closed-circuit and non-video data as well as broadcast television. The name has recently been changed again to National Cable *Telecommunications* Association, recognizing the industry's substantial involvement in telephony and data communications.

The acronym CATV, for community antenna television, is generally applied to systems and operations prior to the 1967 name change and is a subset of the broad generic term *Cable TV*.

Because Cable TV depends on technology, its entrepreneurs often speak of equipment types and performance, the physics of radio transmission, and technical design considerations. These details are included in *Pioneer Tales From Cable TV History* for readers with a background in the technology or history of Cable TV and may be ignored by others. The non-technical financial, political, regulatory, and public relations challenges, as well as the humor and frustration, can be appreciated without trying to understand what may seem inscrutable technicalities.

Recalling events thirty or forty years later is understandably subject to possible confusion, distortion, and error. Some dates are so deeply imprinted in the participant's memory as to be unquestionable. However, other dates tend to become increasingly uncertain as they recede into the accumulated memory bank. An attempt has been made to cross-check dates, both internally in the Oral History and with documentary evidence in published material or legal citations. While the chronology in this volume is believed to be reasonably accurate, errors due to faulty memory remain a possibility.

The final chapter in the book is autobiographical with respect to some of my own background and some of the adventures my colleagues and I encountered in developing Northwest Video in Kalispell, Montana, and its affiliates. In 1953, I joined with three other engineers to build and operate the first CATV system in the state of Montana. From that time, my career has focused largely on Cable TV. Therefore, I have chosen to write in the first person about events and experiences with which I was personally involved. Comments and opinions expressed in the first person plural are believed to represent similar views of many, but not necessarily all CATV operators.

I am especially grateful to The Cable Center for permission to use quotations and information from the Oral Histories. The particular Oral Histories referenced in the text are identified in the References and Bibliography section. Unless otherwise indicated by footnote, direct quotations are attributable, without specific

citation, to the Oral History of the chapter subject. Unfortunately, page numbers for the interview transcripts are not identified on The Cable Center Web site. Because computer display and printer formats tend to differ, it is not feasible to include page numbers in the citations. Moreover, in order to clarify the sometimes muddled grammar and missing words frequently found in *ad lib* discourse, some words have been added to direct quotations.

Publication of this book was made possible through the co-operative efforts of the Cable TV Pioneers, who solicited substantial financial support, and The Cable Center, publisher of record. The enthusiastic support and encouragement of Beverly O'Brien, senior vice president, marketing and development, of The Cable Center, has been the key to successfully implementing this project, and I am tremendously grateful to her. I extend particular thanks to The Center and the Cable TV Pioneers for making it work.

Kim Dority, as consultant to the Magness Institute of The Cable Center, and Beverly O'Brien are engaged in developing an especially effective and creative marketing and promotional program for the book. It was Kim Dority, in her former position as librarian for The Cable Center, who directed me to Constance Hardesty, under whose watchful eye Kathy Kaiser has so carefully and thoughtfully edited the manuscript for publication. Jane Olivier, of Glacier Publishing Services, guided the project through all the steps. Sheryl Tongue prepared the book cover art and page design. Diane Serafin did the proofreading of the completed text, and Michael Haldeman prepared the critically important index. It was a pleasure to work with this professionally competent team, and I am most grateful to all of them for their comments and suggestions.

Special appreciation goes to Frank Drendel, president/CEO of CommScope, and to Ben Conroy, for their steady support and generous financial contributions to the Pioneers in support of the publication of this book, and especially to Rex Porter for his enthusiastic encouragement. The Cable TV Pioneers were represented by Bill Arnold, Frank Drendel, Ben Conroy, Paul Maxwell, Les Read, and Rex Porter.

CHAPTER 1

How Cable Television Began

Cable television was invented, often with heroic effort, to reach out for broadcast television signals well beyond the conventional limits normally imposed by the laws of physics. Commercial television broadcasting in the United States, already several years behind the British, was still further delayed by World War II and the 1948–1952 administrative freeze on new TV stations by the Federal Communications Commission. Cable television began, in 1948, as a response to growing frustration as the public eagerly awaited an opportunity to enjoy the wonders of "picture radio." Jimmy Davidson, Ed Parsons, and probably John Walson represent the vanguard of Cable TV pioneers. Yet, the emergence of Cable TV as an industry was marked by Milt Shapp's dedication to the manufacture of equipment for a nationwide entrepreneurial wired TV system, inspired by his 1950 visit to Bob Tarlton's system, and by Martin Malarkey's leadership in organizing the trade association in 1951.

The Origins of Broadcast Television

Paul Nipkow's mechanical scanning disk, patented in Berlin in 1884, inspired a half-century of research and development seeking a practical way to encode pictures on an electrical current. In 1936, the London Television Service of the British Broadcasting Company (BBC) began scheduled television broadcasting, using the all-electric monochrome system developed by EMI (Electric and Music Industries), with 405 lines per frame, at 25 frames per second, interlaced.[1] At the 1939 New York World's Fair, General David Sarnoff, founder and president of the Radio Corporation of America (RCA), demonstrated to the public an all-electric system developed in part by Philo T. Farnsworth, a farm boy from Utah, and improved by RCA's Vladimir Zworykin, a Russian immigrant.[2]

Stimulated by a crescendo of stories in the media, the public was fascinated by the incomprehensible idea of "picture radio." In mid-1941, the Federal Communications Commission (FCC) authorized commercial television broadcasting with 525 lines and 30 frames interlaced, already several years behind the British.

But the staggering blow at Pearl Harbor on December 7, 1941, extinguished all but the dream of television. During the War, only six experimental stations continued to operate: three in New York City and one each in Philadelphia, Chicago, and Schenectady.[3]

As life returned to civilian "normalcy" after the War, public interest in television intensified. The manufacture of black-and-white TV sets ballooned rapidly, reaching seven million annually by 1950. They were expensive—roughly equivalent to $3,500 in 2004 dollars. Although slowly at first, people were buying them in increasing numbers.[4] Six new stations came on the air in 1946, four more in 1947, and thirty-five in 1948.[5] Eugene Lyons reported that, in 1949, television products represented the largest single category of income for RCA, which at that time was the dominant producer of professional and consumer radio and electronic equipment. Sarnoff declared that this was the year "when television shook off its adolescence and came into man's estate."[6]

However, broadcasters sat on their hands. Worried about the economics of this untested technology, many seemed unwilling to risk the enormous investment required to realize the utterly unpredictable revenue potential. Then, following a stirring speech by General Sarnoff to NBC radio affiliates in September 1947, applications for television broadcasting permits began to snowball. The FCC was deluged with complex applications, practically all of which were mutually exclusive and would have to be sorted out in lengthy comparative hearings. Moreover, the Commission soon discovered that the twelve channels allocated for television broadcasting would not even come close to satisfying the public demand for television service.

Therefore, in September 1948, overwhelmed by the onslaught and alarmed by disturbing complaints of co-channel interference, the FCC once again suspended consideration of new or pending applications for television broadcasting facilities. The freeze was not lifted until 1952. However, it was not until the 1960s—a quarter-century after the inauguration of regularly scheduled programming in Great Britain—that commercial television could be considered generally available in most urban and suburban American markets. Meanwhile, people who lived beyond the fringe coverage of one of the few operating TV stations, or in a valley where the direct line-of-sight was obstructed, were likely to see only "snow" on their expensive new television receiving screens. TV sets languished on dealers' shelves or warehouses, "gathering cobwebs," as Martin Malarkey put it.

Thus, for many frustrating years after the optimistic demonstration at the 1939 World's Fair, the mushrooming public appetite for television, stimulated by exciting descriptions in news supplements and magazines, was endlessly thwarted by a succession of disconcerting obstacles. Even the handful of post-war stations authorized before the 1948 FCC freeze, many of which were west of the Mississippi River, served only to sharpen the disappointment for even more bewildered people. Many traveled great distances just to watch TV in the hotels and taverns that did a gold rush business merely by advertising "Free TV Tonite." Television had come so

near yet was still so far away. Is it any wonder that it was precisely during this period that community antenna television (CATV) began to develop?[7]

It is perhaps speculative to suggest that Cable TV might not have happened but for the war-time and regulatory delays spanning the seventeen years from the 1939 inauguration of television until the final clearing of the backlog of television broadcasting applications, about 1956. For nearly two decades, the emergence of "picture radio" seemed always to be so close at hand yet denied to so many people for so long. The situation during the 1948–1952 freeze was ripe for imaginative entrepreneurs and hobbyists, who had some technical skill or access to it, to create a wired television distribution system. It was not by chance that the early development of Cable TV systems was often in mountain valleys roughly 50 to 150 miles from at least one operating TV station.

If Jimmy Davidson, Ed Parsons, John Walson, Bob Tarlton, Martin Malarkey, Milt Shapp, and others had not started Cable TV in 1948–1950, someone else would have had to do it. Some radio station operators, like Fred Stevenson and Sen. William Fulbright (D-Ark.) in Fayetteville, Arkansas, Ken Gunter in San Angelo, Texas, and Ed Parsons in Astoria, Oregon, saw the community antenna as an opportunity to get into television without waiting for an end to the freeze. But it is truly amazing that so few radio broadcasting professionals responded to the burgeoning public demand to see pioneer performers like Milton Berle and Red Buttons on television, live, or to dream about seeing opera or Shakespeare or even movies at home. Instead, many radio broadcasters feared the competition of television itself. Cable TV symbolized the enemy.

Nevertheless, it is interesting to note that cable television was actually invented and the patent applied for in 1937 by Louis H. Crook, professor of aeronautical engineering at Catholic University in Washington, D.C.[8] Professor Crook described a method for transmitting television pictures and sound to homes over "telephone conductors ... enclosed in a metal tube." A year later, a staff report issued in 1938 by the FCC speculated that, "Transmission (of television) may develop into some sort of wire plant transmission, utilizing the present basic distribution network of the Bell System, with the addition of coaxial cable."[9] Yet, even in 1938, the FCC worried that the Bell System might use its patent position on broadband coaxial cable to delay or thwart the development of independently wired TV systems.

James Y. "Jimmy" Davidson

Born in Little Rock, Arkansas, in 1922, Jimmy Davidson lost his mother when he was eight years old and his father a year later.[10] He and his two younger sisters lived with their grandmother until she died, when Jimmy was twelve years old. He fought and struggled against unspeakable odds to survive through the Great Depression. Somehow, he managed to finish high school while working on the farm, pumping gasoline, repairing radios, and operating the projector in a movie theater. After sixteen months servicing Signal Corps electronic equipment, he

joined the U.S. Navy. The post-War period was a stimulating time for radio service technicians, hobbyists, and amateur radio "hams." Discharged from the Navy in 1946, Jimmy Davidson returned to Tuckerman, Arkansas, and resumed his pre-War activities as manager of the motion picture theater and as a partner in a home appliance business. He also operated a radio repair shop and did some sign painting and commercial photography.

In November 1947, the FCC approved an application by WMC radio in Memphis, Tennessee, for a permit to build a new television broadcasting station. Bored and overworked at the appliance store, Davidson was excited by the new technology. He began making trips to Memphis to follow construction progress for the new TV station. Early in 1948, he and his assistant erected a 100-foot tower and custom-built TV receiving antenna on the roof of the two-story building adjacent to the appliance store and radio repair shop in Tuckerman. "This was the first tower I had ever constructed," he said, "and I could not have done it without the help of my very able and competent assistant, Louis French. It was the first tower we had ever built and it's a wonder we didn't kill ourselves."[11] In the fall of 1948, the WMC-TV transmitting plant was completed, and, in September and October, Davidson began receiving intermittent test patterns and experimental programs transmitted from Memphis.[12] WMC-TV commenced its regular scheduled program service on December 11, 1948.

Meanwhile, Davidson's friend and neighbor, Carl Toler, telegrapher and depot agent for the Missouri Pacific Railroad, was fascinated. He lived about a block from the appliance shop and sometimes left the depot just to come over and watch the test transmissions.[13] So, Davidson said, "I ran [a] drop with RG-59/U [coaxial cable] from the tower to the corner of the two-story building, then to the traffic light in the intersection of the main street and Highway 67. I had no permit to cross the U.S. highway or to attach to the traffic light. From the light, the drop attached to the corner of a theater building, then to a large tree trunk and finally to Mr. Toler's home.[14] ... They paid me $150 for the installation plus $3 a month and stayed on this one-channel system until moving out of town in 1953."[15] Davidson also installed seventeen outlets in the appliance store to demonstrate TV reception and one outlet in the American Legion building next door.[16]

The November 18, 1948, issue of *The Tuckerman Record* carried the following story:

First Television Here on Saturday, November 13, 1948

Tuckerman's first television program was received here Saturday and was made visible to the public through the courtesy of Jimmy Davidson of Auto-Electric Company who installed a television set in the Legion Hut and invited the public to see it.

The program was a trial broadcast of the Tennessee-Ole Miss football game from Memphis and while reception was not clear at all times, those witnessing the broadcast could get the idea of what the real thing will be like when the "bugs" are worked out for this section.[17]

Basking in the enthusiasm inspired by that football game on television, Davidson wanted to wire the whole town for television. But, he said, "I determined that Tuckerman was too small for a viable community antenna project, so I started looking around."[18] He went to Batesville, Arkansas, which had a few thousand households about twenty-five miles west of Tuckerman, where the market seemed more promising. To receive the WMC-TV signals at a distance of 114 miles, he designed and built a massive, sophisticated rhombic antenna covering several acres, suspended on four seventy-five-foot towers. When Davidson donated a 1:16 scale model of the antenna to The Cable Center in 1998, he said, "To my knowledge, it was the first rhombic antenna designed and constructed specifically for cable television."[19] Davidson manufactured some of his own equipment for Batesville and used Jerrold's single-channel antenna booster amplifier, as well as Blonder Tongue's split-band, broadband booster. Davidson said, "Beginning in 1949, it took me several years to complete the Batesville system."[20]

When he built the tower in Tuckerman to receive signals from WMC-TV, Davidson was apparently unaware of any other similar activity. But while he was constructing the Batesville system, he did hear about Parsons' project in Astoria, Oregon, and Bob Tarlton's in Lansford and Martin Malarkey's in Pottsville, Pennsylvania. Hungry for information, he made several trips to Pennsylvania, in his own airplane, and attended the meetings in Pottsville from which the National Community Television Association (NCTA) evolved. He did not join at first, because he felt like an outsider. He learned a lot from these trips and soon had lots of visitors to his system in Batesville who wanted to find out how to get started.[21]

Davidson pioneered five-channel operation in his Batesville system about 1954. He used Entron amplifiers of the type Hank Diambra had developed for use in South Williamsport, Pennsylvania, carrying five adjacent channels for the first time.[22] He soon became a national distributor for Entron and began stocking coaxial cable, amplifiers, and other supplies required for cable systems.[23] Before long, Davidson separated the supply and consulting business from system operations and formed the DAVCO Electronics Corporation. Davidson said, "I go on record as stating that Batesville's DAVCO Electronics was the undisputed first of its kind."[24]

L.E. "Ed" Parsons

Before World War II, Ed Parsons owned and operated the Radio and Electronics Company in Astoria, Oregon, servicing radios, marine and aircraft electronic gear, and refrigeration as well as engineering services.[25] He had both commercial and amateur (W7FKZ) radio operator licenses. During the War, he was a superintendent at the Navy control plant in Portland, working relief shifts at Portland radio station KGW. When he learned that radio station KAST, owned by the local newspaper, the *Astoria Budget,* was losing money and was about to be shut down, he arranged to purchase it—and promptly turned it into a profitable enterprise.

Parsons and his wife Grace, a former Canadian journalist, attended the convention of the National Association of Broadcasters (NAB) in the spring of 1947 in Chicago. It was here they saw television for the first time, and Grace Parsons remarked that she would like to have television at home in Astoria. At the NAB convention the following year, Seattle radio station KRSC announced plans to build a TV station (the call letters were later changed to KING-TV). "Now," she said, "we can have television." Throughout the summer of 1948, Ed Parsons was in constant communication with Bob Priebe, KRSC manager, regarding the progress of construction.

Parsons spent the summer trying to find out whether he could receive signals broadcast from Seattle, 125 miles away. He modified a couple of small FM radio receivers with headphones and a meter across the discriminator to indicate the strength of the received TV signal. One was installed in his car and one in his airplane, and he began to probe throughout the city and all of Clatsop County for signals from Seattle. He discovered what he called a "light effect," by which television signals are diffracted—like beams of light—over the mountainous terrain between Seattle and Astoria, combining in isolated "hot spots." Engineers identify this phenomenon as "obstacle gain." Parsons found several hot spots, one of which was on the roof of the eight-story John Jacob Astor Hotel, across the street from the three-story building where he had a penthouse apartment. It was not the strongest signal he had found, but it was convenient.

Dick Olds worked for Byron Roman's Appliance shop in Astoria in 1948. Olds and Roman often worked with Ed Parsons on his experiments with television reception. Olds soon went to work for Parsons and helped with construction of a rhombic antenna on the roof of the Astor Hotel in December 1949. According to Olds, "He hung it on pulleys, with nylon rope, so that he could adjust the angle of the rhombic. Parsons actually did the tapered [impedance] match himself, into a home-rigged open-wire line and brought the signal [across the street to his penthouse]."[26] Although twin-lead was used initially, it was soon replaced with coaxial cable. The signals from Seattle were received on Channel 5 and converted to Channel 2, in order to avoid interference with the weak received signal. Parsons said, "As a signal-receiving unit, I designed and built a two-stage IF amplifier and a converter to Channel 2 and a three-stage amplifier on Channel 2."

The Seattle television station KRSC-TV broadcast its first scheduled commercial television program on Thanksgiving Day, November 25, 1948. Parsons said, "Reception was not of a quality that would be salable today, but we received a picture and started attracting guests."[27] At first, Grace Parsons served refreshments, but this soon became impractical. "When people drove down from Portland or came from The Dalles or from Klamath Falls to see television, you couldn't tell them no." So he offered to put a TV set in the hotel lobby. "The manager thought that was a wonderful idea," Parsons said. "But a short time later he asked me to remove it because the lobby was so full people couldn't get in to register." Then Parsons ran a line to Cliff Poole's music store on the next street over. Parsons

sold him the TV set, the wire, and the necessary equipment, including the splitter. According to the *Daily Astorian,* April 10, 1962, "Cliff Poole was the first documented cable customer in the nation." The service extension was in operation by January 1, 1949.[28] But then the police complained about people blocking the street outside Poole's show window whenever the television station was on the air.

Thus, it was in the early part of 1949 that Ed Parsons began connecting private homes, taverns, and stores in Astoria. According to an article in *Popular Mechanics,* "He strung cable up buildings, down elevator shafts, through underground tunnels carrying utility lines."[29] As of March 1949, these installations were makeshift and jury-rigged. In Parsons' words, "We would run from house to house through a city block—and Astoria has some pretty large blocks. We'd come to the street, then we would set up a little radiating antenna with one of our amplifiers feeding it, and pick it up on the other side of the street and continue for another block. We'd run all around town this way."[30]

Word of Parsons' activity in Astoria reached the FCC, which requested that Parsons "furnish the Commission full information with respect to the nature of the system, which it appears you may have developed and may be operating." Parsons responded, on August 13, 1949, in part this way: "This was developed and installed experimentally ... as a means of testing the dependability of our reception of TV signals in preparation for the requesting of a construction permit for an experimental station locally in the UHF..."[31] He did apply for a UHF broadcast TV station permit, but it was rejected by the FCC.

Initially, there were no "subscribers," as such. The equipment and the coaxial lines became the cooperative property of the users, who shared the cost of installation, averaging roughly $100 each. Parsons apparently depended on the profit from the sale of television sets to provide income support for the operation.[32] By 1951, however, Parsons established a uniform charge of $125 per installation and a $3 monthly rental fee. In December 1951, he obtained a formal pole attachment agreement with Pacific Tel & Tel and Pacific Power and Light. And, in January 1952, the Common Council of Astoria granted formal permission to Parsons to continue installing cable.[33] By late 1952, the operation was in receivership and reorganized as Clatsop Television Company, owned by thirteen local business and professional people.[34]

Initially, Parsons built his own single-channel amplifiers. He formed Astoria Electronics to manufacture equipment and claimed, "As far as I know, at that time I was the only manufacturer of the equipment." The first commercial amplifiers he saw were Jerrold strip amplifiers, designed for feeding apartment buildings, in the early 1950s. Parsons was instrumental in the development of many other systems in Oregon and Washington, apparently sharing in the ownership as well as providing all of the skill and knowledge for locating antenna sites and designing and constructing the distribution network. In May 1968, L.E. "Ed" Parsons was officially acknowledged by the NCTA as the father of community antenna television, with a granite monument erected on Coxcomb Hill near Astoria.[35]

JOHN WALSON

In his Oral History interview in 1987 with Mary Alice Mayer (Phillips), John Walson (formerly Walsonavich) sets forth his frequently disputed claim that his Cable TV system in Mahanoy City, Pennsylvania, was first, ahead of either Davidson or Parsons.[36] In the interview he said, "I, essentially in June 1948, had a broadband twin-lead system just as they have today, twelve channels which are modern. ... That was when I first started in 1948. ... At that time, I had 725 to 727 customers connected to this twin-lead cable." Military surplus twin-lead was purchased from Reliance Merchandising in Philadelphia. "This twin-lead cable," he said, "was run from the top of the mountain from an ordinary antenna and amplified every 500 feet with a top-of-the-set booster made by ElectroVoice, which is a broadband amplifier."

Correcting an earlier interview, Walson said, "When we went to coaxial cable in 1949, [the rate] was $2.00, not $2.50. The installation rate when we started commercially was $100." Anticipating a question about documentation, Walson said, "The reason that I don't have receipts on this was that back in 1952 I had a fire at my warehouse, and all of those old records were destroyed all the way up to 1950."

Walson claimed that Mr. "Bob" Gray, Pennsylvania Power and Light Company (PP&L) manager, had given temporary *verbal* permission, in June 1948, to attach twin-lead cable to PP&L poles as an experiment. The first formal written agreement was dated January 1, 1951. In order to obtain the pole attachment agreement from PP&L, Walson had to get permission from Mahanoy City to run television cables across various streets within the borough. His letter requesting such permission was dated October 2, 1950, and was granted "a very short while after the letter was written." On August 28, 1950, Walson wrote to the FCC "applying for a license or permit to serve Mahanoy City District with television service for running a line from the mountaintop to Mahanoy City." He believes there was a reply but was unable to find it. (The FCC had no jurisdiction at that time.) It is, of course, possible—perhaps even likely—that Walson did feed signals from an antenna on the "mountaintop" to various homes in Mahanoy City as early as mid-1948 in order to sell TV sets. His letters in August, September, and October 1950 to the FCC, PP&L, and the Borough Council suggest that he became serious about formalizing the appropriate business permits in the latter part of 1950. While there is no evidence that he was aware of Bob Tarlton's CATV activity in 1949 and 1950 in Lansford, scarcely fourteen miles from Mahanoy City, it would be surprising if he were not.

In 1950, William McLaughlin, the chief of police in Mahanoy City, was so impressed with Walson's system that he started another one at the other end of town. Walson told Mary Alice Phillips in a 1970 interview that he purchased the second system in 1970 and merged it with his own.[37] In his 1987 Oral History interview, Walson said, "The McLaughlin system was sold within the last few months to me..." It has been rumored that the legend painted on some of Walson's

service vehicles was changed from "Established 1950" to "Established 1948." If Walson's original system had, in fact, been started in 1948, vehicles acquired with the second system might have been repainted merely to consolidate the two operations.

In 1950, in order to fill the complement of five channels, Walson said, "I decided to bring in New York channels, and those New York channels were very difficult to get because they were 150 air miles away from Mahanoy City. ... By stacking as [many] as thirty-two antennas for one channel ... I was able to bring in ... Channel 11 and Channel 9 out of New York ... with a viewable picture. ... I had a competitor in and around that time, 1950, and I had to do something to try to get the subscribers..." When asked if the press had covered his importation of New York signals, Walson said, "Actually the press did not cover too much about this because the press figured that coaxial cable or Cable TV would be competitive to their reading of newspapers. They felt that Cable TV would put the newspapers out of business, so they didn't carry many reports." Perhaps this might also explain why such a newsworthy event as the start-up of a CATV system in 1948 does not appear to have been noticed in the local newspaper.[38]

More damaging to Walson's claim, however, are the listings in Warren Publishing Company's *Television and Cable Factbook*. Widely recognized as the most reliable data source for Cable TV systems, the *Factbooks*, updated annually, are based largely on information supplied by each system operator in response to questionnaires. From 1953 through 1966, Walson reported 1950 as the starting date for his Mahanoy City system. But in the 1967 and later editions, the starting date is listed as 1948. Coincidentally, it was in May 1968 that Parsons was officially acknowledged by the NCTA as the father of community antenna television. Thus, in the absence of independent evidence or supporting documentation, skepticism remains as to Walson's often vague and inconsistent claims.

Robert J. "Bob" Tarlton

After graduating from high school in 1932, Robert Tarlton had his own little business, repairing radios in Lansford, Pennsylvania.[39] "It was going great," he said. In 1938, his father joined him, and they opened a store selling, as well as repairing, radios. After the War, about 1946, they added a full line of appliances, including television sets. Channel 3 was the only television station operating in Philadelphia at that time. The only place it could be received was in the hilltop community called Summit Hill, just south of Lansford. While the Tarltons sold "dozens and dozens" of TV sets in Summit Hill, television reception was nonexistent in Lansford, half a mile down the backside of the hill. Even in Summit Hill, they almost always had to provide one of Jerrold's single-tube set-top boosters to amplify the fringe-area signal and improve the picture.

Channel 6 began operation in Philadelphia in 1947; Channel 10 in 1948. Tarlton then began using Jerrold's new three-channel booster, designed for dealer displays, hotels, and apartments, using coaxial cable. Late in 1949, he

began experimenting with a second Jerrold apartment booster to re-amplify the output of a single booster, in order to extend the distance the signal could be carried. He found that pictures came through two or three boosters reasonably well, but the sound was completely lost at the second booster. By carefully retuning the Jerrold boosters, Tarlton succeeded in getting usable sound through several such re-amplifications.

In the spring of 1950, he began to plan the installation of a distribution system to deliver television signals to 200 homes. He persuaded George Bright, grandson of the founder of the Bright department stores, and several other retail businessmen to join him in this community television endeavor for Lansford. The group was incorporated as the Panther Valley Television Company. The first phase of the system was completed, and they began connecting subscribers the week before Christmas 1950, with an installation charge of $100 plus $3 a month service charge.

Even before Milton Jerrold Shapp organized the Jerrold Electronics Corporation, he frequently made sales visits to the Tarlton radio-television repair shop as a manufacturer's representative. When Tarlton realized, early in 1950, that he would be purchasing Jerrold boosters in quantity, he went to Philadelphia to arrange for a more favorable price. "Bud" Greene, who was then sales manager for Jerrold, advised Tarlton that the boosters he was using were not designed for cascaded operation and demanded a release from liability in case they did not work.

Curious as to what Tarlton was up to with all those boosters, Milt Shapp and his family went to Lansford on the day before Thanksgiving 1950. Shapp was so excited about what he saw that he perceived the Lansford operation as the first of an entrepreneurial business of community-wide wired television distribution. Tarlton declined to go to work with Shapp but agreed to work with Jerrold's engineers on the design of equipment especially adapted for applications of this type.

MARTIN F. MALARKEY

In Pottsville, Pennsylvania, not far from Lansford, Martin Malarkey managed the Malarkey Music Company, a family business that his father had started many years earlier.[40] He had a degree in accounting and economics from LaSalle University in Philadelphia. The Malarkey Music Company sold radios in addition to musical instruments and sheet music, and had a $75,000 inventory of TV sets "gathering cobwebs," as Malarkey once said. Malarkey knew that the three Philadelphia television stations could be received on Sharp Mountain, outside of town, but not in town where the people lived. With television so tantalizingly close, yet out of reach, many folks drove to Philadelphia just to watch television in one of the taverns or motels.

On a buying trip to New York in 1949, Malarkey stayed at the Waldorf-Astoria. Discovering that TV was available in the guest rooms, he quickly sought out the manager and engineer to find out how they did it. They showed him the antenna on the roof, the coaxial cables pulled through the walls to the rooms, and the RCA

Antennaplex amplifiers, built in the 1930s to distribute radio signals to hotel guest rooms and apartments. In the mid-1940s, Antennaplex was expanded to include television[41] and was used in 1946 to distribute television programs between the NBC studios, offices, and client rooms in the RCA Building.

The Waldorf-Astoria engineer explained to Malarkey that the system was providing service to 500 television receivers in the hotel, and plans were being made to connect another 500 television sets to the system. "This made one hell of an impression on me," Malarkey said, "because I had always believed that one antenna could serve but one television set." After talking it over with some friends, Malarkey went down to talk with RCA engineers in Camden, New Jersey. They were intrigued by the idea and agreed to set up an experiment in Pottsville, at no cost to Malarkey, if he would buy the necessary Antennaplex equipment.

Back in Pottsville, RCA technicians ran coaxial cable from an antenna on Sharp Mountain down to a test home. "The pictures were absolutely gorgeous!" Malarkey exclaimed, as he realized that this was a service that could be sold. He began immediately to put the funds together to build the system. George Bright became a shareholder in Malarkey's venture as well as in Tarlton's. Malarkey obtained permission to attach coaxial cables to utility poles and was granted a permit by the city to string lines across the streets. Shortly after the Lansford system commenced operation, the new Pottsville Cable TV Company connected its first subscriber, early in January 1951. The system was so successful that RCA appointed Malarkey national sales representative for the Antennaplex wired television system.

Milt Shapp was angered by this, and treated Malarkey as an enemy, a dangerous competitor. Although RCA never came close to overtaking Jerrold's dominance in the industry, these two preeminent industry leaders never became truly warm friends.

The story of the pioneer community television systems spread rapidly. Malarkey was soon surrounded with people from across the country, inspired by the idea of community television reception as an entrepreneurial venture. As a natural leader, he quickly became a sort of Cable TV "guru." Visiting entrepreneurs were eager to talk with experienced pioneers to find out how the system worked, how to build it, where to get equipment, and how to operate successfully. However, both pioneer and would-be operators soon encountered a host of unexpected regulatory and taxation hazards, such as an 8 percent excise tax that the Internal Revenue Service was trying to enforce. Also, broadcasters were pressing the FCC to investigate and regulate these community TV systems. And telephone companies were having second thoughts about allowing Cable TV attachments to their poles.

To discuss these and other matters, Malarkey called for a meeting to be held on September 18, 1951, at the Necho Allen Hotel in Pottsville. According to the minutes of that meeting, "It was unanimously decided that there was need for a National Community Television Council which could take up the problems of the industry as a whole ... [and] employ the best tax consultants and lawyers to contest

the immediate problems facing them." The first formal meeting of the National Community Television Council was held on January 16, 1952. Malarkey, who served as its president, said, "Each of us put $1,000 in the treasury. We started with a $9,000 kitty, and I was authorized to look into the hiring of legal counsel. The first person I contacted was E. Stratford Smith." At Smith's recommendation, the name was officially changed to National Community Television Association, at a special meeting on January 28, 1952.[42]

The First Annual Convention of the NCTA was called for June 9, 1952, at the Necho Allen Hotel in Pottsville. Some sixty or so operators were present, and several manufacturers were represented.[43] Malarkey was elected president and served five consecutive one-year terms as leader of the organization. Bill Daniels succeeded him in June 1956.

MILTON JERROLD SHAPP

Probably no one is more widely identified with the dawn of cable television than Milton Jerrold Shapp.[44] From 1948, when he organized Jerrold Electronics Corporation on little more than a shoestring, until 1971 when he was inaugurated for the first of two four-year terms as governor of Pennsylvania, media reports about Cable TV routinely featured Jerrold Electronics or its founder.

Milt Shapp was born in Cleveland, Ohio, on June 25, 1912. At the early age of eight or nine years, he would spend many exciting days with a family friend who had a remarkable ham radio setup. Although he never had an amateur radio license, Shapp became deeply involved in radio and determined to study electrical engineering. He graduated from Case Institute of Technology (now Case Western Reserve University) in 1933 with a bachelor of science degree in electrical engineering.

Shapp was an instinctive entrepreneur, constantly on the alert for opportunities entailing engineering and marketing skills rather than deep pockets (which he did not have). His first job after graduation, in the middle of the Great Depression, was driving a coal truck seven days a week, for $1.50 a day. He quickly found an opening as a field service engineer with the Radiart Corporation, in Cleveland, which manufactured the vibrators used to provide ac power for automobile radios. In a short time, he became eastern sales manager, conducting seminars on auto radio servicing and becoming widely known in the radio parts industry. Before the outbreak of World War II, he had already established his own sales organization, headquartered in Philadelphia. After three and a half years with the U.S. Army Signal Corps, he left with the rank of captain and came back to Philadelphia to restart his business, focusing on television receiver manufacturers and broadcasters.

Sometime in the latter part of 1947, Shapp met Donald Kirk Jr., a graduate engineering student at the Naval Academy in Annapolis, Maryland. Kirk had built a little gain box, which he inserted in the antenna lead of a television receiver he was developing. The improvement in the picture was dramatic. Shapp was impressed, and he focused on the idea that an antenna booster like that

could be sold to millions of television viewers. In March 1948, with a cash investment of $500, Milt Shapp organized the company he called Jerrold Electronics Corporation, to produce Kirk's little TV booster as its first and only product. After visiting Tarlton's project in Lansford, Shapp assigned Jerrold engineers—Donald Kirk, Henry Arbeiter, Keneth Simons, and others—to work with Tarlton to develop amplifiers and ancillary equipment designed especially to operate in the long cascades (series strings) required for community-wide distribution.

First Pioneers

The history of cable television as an industry really begins in 1950–1951 with the community antenna distribution systems intentionally established by Bob Tarlton and Martin Malarkey as entrepreneurial enterprises in Lansford and Pottsville, Pennsylvania. Milt Shapp's visit to Lansford on the day before Thanksgiving 1950 inspired his vision of a nationwide television distribution industry, to which he would thenceforth wholly dedicate the full measure of the skill and resources of his Jerrold Electronics Corporation. Martin Malarkey's leadership in organizing the trade association, widely recognized at this time as the National Community Television Association, quickly transformed a group of individual entrepreneurial pioneers into a cohesive and effective industry.

The evidence is clear that, in 1948, both Jimmy Davidson (November 13, 1948) and Ed Parsons (November 25, 1948) actually delivered viewable television signals, received far beyond the normal horizon, to multiple outlets, a year or two ahead of Tarlton and Malarkey. Neither Davidson nor Parsons actually started a community-wide Cable TV business in 1948. It was apparently mid-1951 before Davidson's system in Batesville commenced operation. And it was apparently not until 1951 that Parsons realized that this was a business, not just a hobby. John Walson claims that he also connected multiple households to a common antenna in June 1948, although independent evidence supporting his claim has not been forthcoming. Thus the words on the NCTA-sanctioned monument on Coxcomb Hill in Astoria, honoring Ed Parsons as the father of community antenna television, may not be as solid as the marble on which they were carved.

In any case, it would be hard to believe these were the only experiments with community television receiving antennas under way in 1948 or before. A 1950 trade publication reported a very early system in Franklin, Pennsylvania, owned by Haren Corporation of Franklin and surrounded by mountains. Television signals were received from Pittsburgh, sixty-five miles away, "on multi-bay antennas installed on nearby mountaintops and fed along a five-mile line to the town." According to this report, "It serves over 40 outlets in homes and places of business. Householders pay $9.25 per month." Both coaxial and "flat line" (twin-lead) were run from house to house, wherever permission could be obtained.[45] Little more is known about the Franklin system except that Smith, then a young attorney with the FCC, was dispatched to investigate the report. He was "fascinated" by that system, saying, "I think it had three channels. Just a simple Yagi antenna

located on a hilltop not too far from the airport with twin-lead wire and amplifiers attached to trees and fence posts or whatever was handy and didn't move. ... Although my memory is not precise so far back, I know there was a monthly charge in the $2.50 to $3.50 range, and there was an initial installation charge to cover the costs of extending the system."[46]

Davidson also reported "an early but unheralded pioneer" in Fort Payne, Alabama, who died shortly after putting his system in operation. Davidson said later, "The system was in terrible disrepair, and I subsequently rebuilt it for his wife and daughter."[47]

Whether any of these early systems used coaxial cable or twin-lead initially or whether the first user actually paid a fee are fine points of passing historical significance. Nevertheless, Davidson, Parsons, Walson, and probably other imaginative individuals deserve recognition as pioneers—with or without credible chronological documentation—for applying significant technical knowledge and skill to the task of receiving television signals at a time when conventional wisdom said "Impossible!"

NOTES

1. Albert Abramson, *The History of Television, 1880 to 1941* (Jefferson, N.C.: McFarland, 1987), p. 234.
2. Andrew F. Inglis, *Behind the Tube* (Boston: Focal Press, 1990), pp. 169–173, 182.
3. Ibid., pp. 183–185.
4. Ibid., p. 236.
5. Albert Warren, ed. *Television & Cable Factbook*, vol. 67 (Washington, D.C.: Warren Publishing Company, 1999), p. J-45.
6. Eugene Lyons, *David Sarnoff* (New York: Harper, 1966), p. 280.
7. The acronym CATV is generally applied to systems and operations receiving primarily off-air television broadcast signals. About 1967, the scope of the industry was broadened to include closed-circuit and data transmissions. CATV is a subset of the broad generic term, Cable TV.
8. L.H. Crook, U.S. Patent No. 2,222,606.
9. Federal Communications Commission, Staff Report of FCC Investigation of the Telephone Industry, pursuant to Public Resolution No. 8., 74th Congress (Washington, D.C., 1938).
10. The material in this section is based on James Y. Davidson, *50th Anniversary* (Cabot, Ark.: James Y. Davidson, 1998).
11. Ibid., p. 90.
12. Ibid., pp. 20–21, 91.
13. Ibid., p. 48.
14. Ibid., p. 20, 70–71.
15. Ibid., p. 57.
16. Ibid., p. 20.
17. Ibid., p. 55.
18. Ibid., p. 21.
19. Ibid., p. 168.
20. Ibid., p. 58.
21. Ibid., p. 71.

22. Ibid., pp. 72–73.
23. Ibid., p. 60.
24. Ibid., p. 59.
25. The material in this section is based on *L.E. Parsons, An Oral History*, interview by Richard Barton, June 1986 (Denver: The Cable Center).
26. From an interview with Richard Olds, 1994.
27. Mary Alice Mayer Phillips, *CATV: A History of Community Antenna Television* (Ph.D. diss., Graduate School of Northwestern University, 1972), updated by Phillips, p. 13.
28. Phillips, p. 14.
29. Rafe Gibbs, "Small Town Television," *Popular Mechanics* (April 1950), p. 117.
30. Phillips, p. 14.
31. Ibid., p. 16–17.
32. Ibid., p. 14.
33. Ibid., p. 26.
34. Ibid., pp. 26–27.
35. Ibid., pp. 11, 27.
36. The material in this section is based on two main sources: *John Walson, An Oral History*, interview by Mary Alice Mayer (Phillips), August 1987 (Denver: The Cable Center); and Mary Alice Mayer Phillips, *CATV: A History of Community Antenna Television*, op. cit. John Walson changed his name from Walsonavich in the 1960s.
37. Phillips, p. 10.
38. Thomas Southwick. "Celebrating 50 Years," *Cable World* (October 26, 1998), p. 62.
39. The material in this section is based on *Robert J. Tarlton, An Oral History*, interview by Lorna Rasmussen, April 1993 (Denver: The Cable Center).
40. The material in this section is based on *Martin F. Malarkey, An Oral History*, interview by Kathleen B. Hom, August 1985 (Denver: The Cable Center).
41. Donald G. Fink, ed. "Television Antennas for Apartments," *Electronics* 20, no. 5 (May 1947): p. 96; and Heinz E. Kallmann, "Television Antenna and RF Distribution Systems for Apartment Houses," *Proc. IRE* 36 (September 1948): pp. 1153–1160.
42. Phillips, pp. 29–33. This is a corrected version of the chronology in *History Between Their Ears*.
43. *Television Digest*, 1952, p. 3.
44. *Milton J. Shapp, An Oral History*, interview by David L. Phillips, June 12, 1986 (Denver: The Cable Center).
45. Donald G. Fink, ed. "Community TV Antenna System," *Electronics* 23, no. 9 (September 1950): p. 182.
46. *E. Stratford Smith, An Oral History*, interview by Pat Parsons, March 1986 (Denver: The Cable Center).
47. Davidson, p. 42.

CHAPTER 2

UNFAIR COMPETITION AND COPYRIGHT

And cable, as I see it today, cable is a thief. It is a pirate.[1]

—Henry Geller, former general counsel for the FCC

I admire your courage. Inviting a broadcaster to become a member of the Montana Cable Television Association is like trying to recruit FBI widows for the John Dillinger Fan Club. I read the by-laws with great interest. They appear to be an earnest effort to perpetuate the age-old and very misleading fable of "honor among thieves." This should not be taken literally by your more sensitive members since in fact the actions of your group as yet have not been found to be felonious, and the definition of thievery has a connotation of stealth, whereas your group has always appropriated television signals very openly.[2]

—Joe Sample, TV broadcaster, Billings, Montana

CABLE TELEVISION UNDER SIEGE

Unfair competition, economic injury, and piracy head the list of broadcasters' complaints that have dogged the Cable TV industry throughout its history, especially during the three decades before the satellite era. However, in no way could the irascible Captain Kidd or Jean Lafitte be construed as role models for those intrepid Cable TV pioneers in Astoria, Tuckerman, Lansford, Pottsville, Mahanoy City, and elsewhere.

Cable TV got its start in villages, small towns, and other communities, where there was virtually no television. In the early days, we were comfortable, as system operators, in the belief that Cable TV was simply a community antenna assisting the general public to receive signals broadcast by television stations, regardless of the program content of those signals. That we might be infringing on copyrights did not even occur to us at first. It was assumed, if we thought about it at all, that the programs broadcast over the air by television stations had already been cleared

to be received by the public. We thought we were simply helping our customers to receive the programs to which they were entitled. As such, we believed we were actually benefiting broadcasters by extending their service areas and providing improved reception for subscribers. How could Cable TV be held responsible for paying copyright fees when it had no control over the particular programs that might be carried on the signals it distributed to subscribers? We fully expected that someday there would be television broadcasting stations in most of our own communities or reasonably nearby. And we wondered, "Would anyone really pay for Cable TV if they could receive television signals with simple rabbit-ear or rooftop antennas?"

In 1952, the FCC lifted its freeze on new television broadcast stations. The situation was now becoming a bit more complex, with new TV stations starting up in existing Cable TV communities, and new Cable TV systems beginning to operate in communities where one or more local stations already existed. In addition to carrying the local TV signal, Cable TV continued to receive, for its customers, distant signals that could not readily be picked up in the community. Local stations in small markets were often "cherry pickers," broadcasting selected programs from more than one national network, as well as various non-network programs. With distant signals carried on cable, subscribers had the opportunity to view a variety of network and non-network programs that were not broadcast by the local station (professional and college sports, for example). Customers liked it and continued to subscribe, even when they could receive local television signals over the air without Cable TV.

Moreover, Cable TV subscribers on systems carrying distant station signals now had the opportunity to view certain programs that were identical to programs for which the local station had obtained exclusive time and territorial broadcasting rights. Such "duplication" of network programs on Cable TV is usually simultaneous, except in situations involving different time zones. However, the scheduled time for broadcasting non-network (syndicated) programs on the distant station often differs from that of the local broadcast of the same program.

This is where the local broadcasters began to get irritated. At first, they focused on unfair competition, complaining that Cable TV was trespassing on the service areas allotted to television broadcasters in the FCC's Sixth Report and Order and delivering programs to their customers in direct competition with licensed broadcast services and without FCC authorization. Then they argued that Cable TV was causing severe economic injury, complaining that loss of viewers adversely affected their advertising revenue, forcing them into bankruptcy. *Free television* would be destroyed, they alleged, and coverage of local news, issues, and events would be denied. Some broadcasters complained, without factual evidence, that Cable TV operators refused to carry the local station signals. Some even alleged that their signals had been deliberately degraded by Cable TV in favor of the distant programs. However, no one ever claimed the substantial reward offered

by Bill Daniels—$10,000 or more—for proof of deliberate degradation by any Cable TV system.

Underlying all these complaints was a more substantive charge that broadcasters had to pay for their programming, while Cable TV merely picked it up. They complained bitterly about losing viewers to programs imported from distant TV stations by Cable TV systems. But their perception that Cable TV systems do not pay for the programs carried on their cables became a relentless burr under their saddles. And so, they called us pirates!

Led by Bill Grove, an "implacable and tenacious foe of Cable TV," from Cheyenne, Wyoming, a group of mostly western broadcasters "constantly and hysterically" complained that Cable TV was causing small market stations to go dark and inhibiting new ones.[3] According to E. Stratford Smith, former special counsel to the NCTA, "Neither broadcasters, the FCC, nor congressional investigating committees were ever able to document their claims."[4] These complaints came to a head in two critical lawsuits, *Fortnightly* and *Carter Mountain*.

FORTNIGHTLY

In June 1960, United Artists Television filed a complaint, identified as *United Artists Television Inc. v. Fortnightly Corporation,* in U.S. District Court for the Southern District of New York. The plaintiff alleged that the cable television systems owned by the Fortnightly Corporation in Clarksburg and Fairmont, West Virginia, had illegally sold to their cable customers programs that had been produced and copyrighted by United Artists Television.

Broadcasters and their attorneys, as well as FCC officials, were smugly confident that Fortnightly Corporation would be found guilty of copyright infringement. The Cable TV industry was worried and mobilized substantial forces in its defense. Cable TV Pioneer Sandford Randolph (see Chapter 3), a member of the NCTA Board of Directors, was general manager of the systems at Clarksburg and Fairmont and became an important witness in the trial proceedings.

NCTA's Smith explained, "NCTA would finance the legal costs of the defense in exchange for having control over the litigation. The New York law firm of Cleary Gottlieb Steen and Hamilton, a very prestigious firm, was counsel to Fortnightly. I met with two of their Washington partners, Robert Barnard and Jack Mallory, in my office and we discussed the case at length. They agreed to accept the master antenna theory as the legal rationale for our defense, and it was agreed that the two firms, theirs and mine, would jointly handle the case, with the Cleary Gottlieb firm being the lead counsel. We undertook to establish that, under our commercial system of broadcasting, the copyright owners had already been paid by the advertisers for the right to broadcast, and that, once broadcast, the programs were intended by law to be received for private viewing. Cable TV was simply the [master antenna] receiving mechanism—not a performer or seller of programs."[5]

After six years of preparation and discovery, the trial in the U.S. District Court for the Southern District of New York took about six weeks. "We lost the case before the District Court," Smith said. "Judge Herland ruled that CATV reception and distribution of the signals of the TV stations was an unauthorized public performance of the programs for profit and, therefore, an infringement of the copyrights. ... Of course we appealed to the Court of Appeals for the Third Circuit. The case was argued before a three-judge panel. Here, we lost to a unanimous court." Notwithstanding, the lawyers prepared and presented to the U.S. Supreme Court a petition for *writ of certiorari*, asking the court to hear arguments on the appeal. Smith said, "We were frankly most uneasy as to whether the court would grant us oral argument, since we did not have a single judge in our favor in the two lower courts."[6]

By fortuitous coincidence, however, the court had received at the same time the FCC's petition for *writ of certiorari* in the case of *United States v. Southwestern Cable Company*, regarding the validity of FCC rules regulating Cable TV. According to Smith, "The FCC had based the need for its Second Report and Order rules [in the *Southwestern* case] on the theory that Cable TV was engaged in unfair competition because it did not pay copyright [fees]. The Supreme Court granted [the FCC petition, agreeing to] hear oral argument on the validity of the rules. Our petition for *writ of certiorari* had already been filed," Smith said. "But when we saw the FCC's brief in support of its petition for *writ of certiorari*, we asked for leave to file a supplementary brief in support of our petition. [We] pointed out to the court that the copyright issue in our case was at the root of the rules at issue in *Southwestern*. The court got the message and granted our petition, designating both cases for argument to be heard on the same day."

Smith continued, "I have often thought that we rode our way into the Supreme Court on the back of *United States v. Southwestern Cable Company*. But for the fortuitous timing, we may not have made it. The circumstances were both serendipitous and ironic. The two cases originated years apart in different courts with no legal issues in common and were in all other respects entirely unrelated. They arrived at the Supreme Court at the same time. Fortnightly had lost its case in the two lower courts, whereas Southwestern [Cable] had prevailed [against the FCC] in the Court of Appeals. Fortnightly won [in the Supreme Court], whereas Southwestern [Cable] lost. Both cases were to have a great impact on the future of the industry."

It had taken eight years to get to the Supreme Court. Following the oral argument, attorneys spent several more weeks of waiting each Monday morning for a ruling in the case. On June 10, 1968, the court ruled in the *Southwestern* case. As paraphrased by Smith in his Oral History, "The U.S. Supreme Court ... held that the FCC could regulate Cable TV to the extent that its regulations were reasonably ancillary to carrying out its responsibilities for the effective regulation of television broadcasting."[7]

Finally, one week later on June 17, 1968, the long wait was over. In Smith's words: "Chief Justice Earl Warren announced that Mr. Justice Potter Stewart would deliver the opinion of the court. Two paragraphs into the opinion, we knew we had won. ... It took some doing to maintain our professional dignities until the justice finished. We just glanced at each other and hung in. It's pretty dangerous to sprint on those marble floors of the Supreme Court building, but to say that we hurried to the telephones would be an understatement." Smith called Bob L'Heureux, who had resigned as NCTA general counsel and was now one of Smith's law partners, and yelled out, "We won! We won! Master antenna all the way!" It was a five-to-one decision, with three justices not participating. Cable television had been spared what very well could have been a deadly blow. Some broadcasters, as well as FCC General Counsel Henry Geller, have said that the United Artists' case was not well presented by the renowned trial lawyer, Louis Nizer, which may have contributed to a favorable ruling for the cable television industry.[8] The rulings in the two cases confirmed the FCC's relatively broad authority to regulate Cable TV, leaving the matter of copyright to FCC and the Congress.

The Consensus Agreement on Copyrights

Encouraged by the Supreme Court ruling in the *Fortnightly* case, the cable television industry proceeded to negotiate from a position of strength with respect to the copyright legislation that followed. After extensive bargaining, broadcasters, programmers, and the Cable TV industry reached a Consensus Agreement on Copyrights. The Cable TV industry agreed to support congressional revision of the copyright laws, while broadcasters and programmers agreed to support relaxed restrictions on importation of distant signals. The resulting 1976 Copyright Act imposed a mandatory license system of regulated royalties to be administered by a new Copyright Royalty Tribunal. Daniel Brenner, NCTA counsel, said in his book, "Initially, the rates were set at a low level to aid the developing Cable TV industry, while the harm done to broadcasters and copyright owners was minimized by the rules limiting distant signal importation and protecting syndicated exclusivity."[26] While the compromise agreement has not entirely satisfied all parties, the ongoing controversy focuses largely on the rate structure.

Carter Mountain

In the meantime, in 1961, Carter Mountain Transmission Corporation of Wyoming applied for a microwave common carrier permit to relay the signals of four Salt Lake City television stations to several Cable TV systems in Wyoming and a TV station in Billings, Montana. Roy Bliss Sr., Tom Mitchell (see Chapter 4), and others were the owners of the Carter Mountain Transmission Corporation and most (but not all) of the Cable TV systems. Mildred and Joseph Ernst, owners of a small TV station, nominally in Thermopolis, Wyoming (population 3,000), protested the application on grounds that economic injury would result, thus

adversely affecting the public interest. After first granting the permit, the FCC responded to the protest by suspending the grant. After a hearing, two conditions were specified for reinstatement: The cable systems served by Carter Mountain must (1) carry the signal of the Thermopolis TV station, and (2) protect the station's program exclusivity for a period of thirty days before and after its scheduled broadcast. In taking this action, the FCC overruled its own hearing examiner, who had found no factual evidence of serious economic injury in the record. Moreover, the commission acted against the advice of its own Common Carrier Bureau that restricting the end use for a common carrier permit could be illegal.[10]

The FCC ruling was upheld on appeal in *Carter Mountain Transmission Corporation v. FCC*, and the U.S. Supreme Court declined to hear further arguments. Carter Mountain Transmission would not agree to the non-duplication condition, and the permit was denied. However, the FCC soon extended the conditions to all non-microwave Cable TV systems, although the period in which the broadcast stations had exclusive rights to programs was reduced, first to fifteen days before and after, then to the same day, and finally, in 1972, to simultaneous non-duplication.

Even before the unexpected 1968 decision by the U.S. Supreme Court in the *Fortnightly* case, broadcasters in the major urban markets had been demanding that CATV be regulated out of their markets. Responding to these pressures, the FCC adopted its Second Report and Order in 1966 that prohibited extending the signals of major market TV stations beyond their defined (Grade B) service area, unless shown in evidentiary hearing to be consistent with the public interest. This was a catastrophic blow, directed at the heart of Cable TV's reason for being. Although existing systems were grandfathered, no new systems could be built without lengthy and expensive hearings. Expressing concern that Cable TV "is not concerned with bidding against competing broadcasters for the right to exhibit ... programs nor bargaining with program suppliers for time and territorial exclusivity," the Commission asked Congress to consider extending to Cable TV the requirement applied to broadcasters that consent be obtained from the copyright holder before any program could be retransmitted (see below).[11]

After the June 17, 1968, Supreme Court ruling in *Fortnightly*, the FCC announced a new Notice of Proposed Rule Making. The burdensome major market hearings required for distant signal carriage in the 1966 Second Report and Order would be terminated.[12] But Congress had failed to act on the Commission's suggestion of retransmission consent as a method for dealing with the alleged "unfair competition," and the *Fortnightly* ruling did not take the FCC off the hook. Therefore, the Commission proposed to adopt new rules defining which distant signals could be brought into what sized markets, with retransmission consent required in most circumstances. However, this was a "Catch 22," since broadcasters rarely own or control the copyrights and therefore could not legally grant retransmission consent. According to Smith, "The practical result would be that cable systems would have to negotiate a myriad of copyright licenses in order to

clear each program viewed on all channels. This ... would impose a burden that would destroy all but the largest systems."[13] The proposed rules were not adopted, pending the outcome of copyright legislation in Congress.

Henry Geller

The intensity of the anger and depth of conviction on the part of broadcasters, producers, and regulators in the matter of copyrights are starkly mirrored in Henry Geller's Oral History. Geller came to the FCC in 1951 as a bright, young, idealistic lawyer, shortly before the FCC lifted its freeze on applications for new television broadcasting stations. At first, he worked in the FM radio section of the Broadcast Bureau. Cable TV was not yet seen as a pressing regulatory problem. As time passed, however, he became aware of the broadcasters' allegations about economic injury suffered at the hands of Cable TV. Broadcasters were charging Cable TV with unfair competition for viewers by importing programs from outside the local market and selling them to customers without permission.

David Paglin, oral historian for the Golden Jubilee Commission on Telecommunications and son of former FCC General Counsel Max Paglin, conducted the interview for The Cable Center (Denver, Colorado) in 1985–1987. Ranging well beyond Geller's views on Cable TV, the interview presents a revealing and substantive discussion of his philosophy of government and communications policy as it evolved over a lifetime of public service. In 1999, Geller became the first recipient of the Lifetime Achievement Award of the Federal Communications Bar Association. The complete transcript of his Oral History interview is available at www.cablecenter.org and is well worth reading.

Henry Geller was born in Springfield, Massachusetts, on Valentine's Day in 1924. His parents were Jewish immigrants—his father from Russia and his mother from Poland. He grew up in Detroit, where his father built homes, and graduated from high school at the age of sixteen. Immediately, he entered the University of Michigan at Ann Arbor and graduated with a degree in chemistry, at the age of nineteen.

In 1946, after two years of military service, he began working on a master's degree in chemistry at Northwestern University in Evanston, Illinois, under the GI Bill. He was bored by the laboratory work and transferred to the Graduate Law School. He said, "It doesn't reflect very well on me, but it is the truth. ... You've got to realize that I was quite young. ... What I wanted was not to be bothered and to spend three years having a good time. And I did. I had a joyous time. ... Law school is remarkably easy."[14]

When Geller graduated from Northwestern Law School in 1949, Willard Wirtz (a professor who later became U.S. secretary of labor) put him in touch with Harry Plotkin, FCC general counsel. After brief stints as clerk at the National Labor Relations Board and at the Department of Justice, Geller was hired in 1951 to work in the Broadcast Bureau of the FCC. In 1961, President John F. Kennedy appointed Newton N. Minow chairman of the FCC. Minow asked General Counsel Paglin and

Geller, who had become his deputy in 1962, to investigate what he called "the Cable TV mess" and get it off his desk. Geller began meeting with attorneys E. Stratford Smith and Robert L'Heureux, representing the NCTA.

Geller said in his interview that when United Artists filed suit against the Fortnightly Corporation, "I was horrified by cable's ability to move signals around without regard to the market. It didn't make any sense to me.[15] ... I have no great interest in stopping cable. I believe in cable. I believe in the diversity of cable. I don't believe in what I consider to be an outrageous practice, of cable just being a pirate. [But] then, as soon as we get over the piracy, let cable be cable. Let it do what it wants, free of all government regulations. There is no need to regulate it. It's in the market. It's another distribution force in the market. And it's operating fairly. [Then it] is not a pirate. And that is what was motivating me."[16]

GELLER'S STRATEGY

The FCC's 1966 Second Report and Order effectively froze development of cable television by requiring costly and time-consuming evidentiary hearings for permission to import distant signals. It was based on the FCC authority to regulate cable television, as provided in the *Carter Mountain* case and confirmed in the *Southwestern Cable* ruling. Geller said, "It was a conscious strategy ... that I was following—one that depended upon one thing and one thing alone—and that is that cable stood outside the competitive TV programming market. That made no sense. It [cable] was a manner of distributing programming, and therefore my strategy was to wait for the copyright cases [and] to hold back cable's development in the major markets until the copyright [*Fortnightly*] case was decided. ... My view of the matter was that cable was sure to lose the copyright case because, after all, [the court would be] looking at the precedents."[17]

Geller said, "The court cases proceeded, and the copyright case went well in the district court—the programmers won. It went well in the Court of Appeals—the programmers won. It then went to the Supreme Court and along with it, at the same time, *United States v. Southwestern Cable Company* arrived ... [regarding] our [FCC's] jurisdiction over cable television. The whole thing came apart in 1968, unfortunately. That whole strategy ... because while we won *Southwestern Cable,* and we had jurisdiction to freeze cable, the programmers—in an astonishing decision by the Supreme Court—lost the copyright."[18]

Geller explained, "[The Court held that] it was a matter for Congress to bring cable within the copyright law, [and that] cable was not a performer. I think that is one of the most stupid decisions that the Supreme Court has ever rendered![19] ... I think that the answer to the thing, mostly, [was] that the Supreme Court legislates, and they did not want the copyright industry to have control over cable." Therefore, according to Geller, the Supreme Court thought, "What a good way to do it. We'll tell Congress to do it, and in the meantime, we'll let cable continue to develop, but we don't have to worry about it running awry because we've given the FCC the power to check it. So cable will be checked by the FCC.

Congress will solve it all. And we have struck a good balance here. FCC, you have authority to control its growth. But, copyright owners, you can't stifle it. If we hold for you, cable is dead." Geller then said, "It was just a mistake on their part, because the real solution was copyright, and not the FCC. They just mucked it up!"[20]

RETRANSMISSION CONSENT

After the *Fortnightly* ruling, Geller said, "My strategy came to nothing. ... I had no notion that we were going to lose that case. I'm just astonished. It was one of the biggest mistakes I ever made. ... I never thought that the Supreme Court would do what it did in the *Fortnightly* case. I thought I was being too clever by half, letting the courts do my work for me. ... If I could go back, one of the things I would do now—it's all hindsight. If I were doing it again in 1965 and in 1966, I would go back and simply propose a rule that paralleled Section 325 [of the Communications Act]. Section 325 says that a broadcast station cannot do retransmission of another broadcast signal without the express consent of that originating station. I would have held that cable is, in effect, the equivalent of a station retransmitting. ... And therefore, the only regulation I would adopt is [to] get the consent of the originating station."[21]

Geller recalled that the retransmission consent solution had been proposed by NBC. But, he looked at it and said, "Sure, it's a way out. But why should I take the risk of throwing the dice to see if I win that? All I've got to do is freeze cable's development in the major markets until copyright comes in and I win everything in a case that's already there, called *Fortnightly*, which I thought was a lead-pipe cinch to be won by the programmers.[22] ... My motivation was to bring about what I considered fair competition, and I thought I had a peachy-keen scheme to do it, a sure-fire, infallible one, and that—by God—I couldn't miss! I was using a freeze to wait for a case that I was sure was going to be won and the way I wanted, and then we would all live happily ever after at the seashore! Ha! Ha! And I just blew it. And once I blew it, I never could go back and do retransmission [consent]. I tried, but my time had come and gone."[23]

Geller acknowledged that the retransmission consent solution was a "Catch 22" situation. He said, "The point is that the originating station would not give consent because of the fact that he had copyright clearance only for his own area. [He] would not give consent and could not under the copyright law.[24] ... The only way you could get consent of the originating station was if the originating station had the ability to give it. And only Ted Turner and the TBS [Turner Broadcasting System]—which did not exist at that time—can give consent, because he's the only one who controls the Atlanta Flames, the Atlanta Hawks, the Atlanta Braves, and who buys programming in a way that he can give consent throughout the nation. ... And then I would have done the equivalent of what I wanted to happen in *Fortnightly*—an FCC rule. Retransmission consent went out

[as a proposed rule], but it was too late. ... We put it out in 1969, as I recall. It just sat there and was a way of freezing [cable] television."[25]

SATELLITES

The cable television landscape was profoundly altered by the 1975 bellwether satellite relay of the Muhammad Ali versus Joe Frazer prize fight from Manila to Cable TV systems in the United States—the "Thrilla from Manila." Enticed by the dramatically successful demonstration of satellite program relay, a flood of new, non-broadcast "niche" programming networks with Cable TV systems as affiliates began to emerge. Satellite program networks quickly eliminated the cable industry's interest in carrying distant terrestrial television signals. Moreover, the availability of a strong supply of program material not broadcast over the air provided the impetus to develop cable systems in urban cities already well served by multiple broadcasting stations. Compensation for copyrights was included in payment for the right to distribute satellite network programming by cable television. Copyright compensation for carriage of signals of TV broadcasting stations was covered by the mandatory blanket license.

Copyright piracy is no longer a passionate issue. However, retransmission consent resurfaced in the 1984 and 1992 acts of Congress. Local broadcasting stations were given a choice. The station could elect to require cable systems in its service area to carry its signal but with no compensation from the cable system. Alternatively, a local station could enter into negotiations with the cable system regarding compensation to be paid by the cable operator, for permission to carry its signal voluntarily. In this case, the cable operator would not be legally obliged to carry the local signal without a mutually acceptable compensation agreement.

This odd arrangement has resulted in various non-monetary demands by broadcasters. For example, Rupert Murdoch's Fox Network recently presented Cox Cablevision with a demand that, in exchange for permission to carry the signals of Fox broadcast network affiliates, all of Cox's systems must carry certain Fox-owned, non-broadcast cable satellite programs, at specified channel positions on its cable networks. Cox rejected the demand and attempted to terminate carriage of the local Fox stations, as provided by law. However, the public and franchise authorities vigorously protested the deletion of the local TV signal, and the matter was eventually compromised. Cox had few options. The public largely controlled the negotiating leverage. It is ironic that what started out as a concern for intellectual property rights and exclusivity began to look like piracy in reverse.

Broadcasters generally, with notable exceptions, still do not like Cable TV. But probably because Cable TV is now paying for the mandatory blanket license covering copyright programs, they seldom call us "pirates" any more.

NOTES

1. *Henry Geller, An Oral History*, interview by David Paglin, November 1985 (Denver: The Cable Center).
2. Joseph S. Sample, letter to the author, October 23, 1961.
3. *E. Stratford Smith, An Oral History*, interview by Pat Parsons, March 1986 (Denver: The Cable Center).
4. Ibid.
5. Ibid.
6. Ibid.
7. Ibid.
8. Geller, op. cit.
9. Daniel L. Brenner and Monroe E. Price, *Cable Television and Other Nonbroadcast Video; Law and Policy*, Release No. 2 (New York: Clark Boardman Company, May 1989), pp. 9-6 through 9-8.
10. Smith, op. cit.
11. E. Stratford Smith, "The Emergence of CATV: A Look at the Evolution of a Revolution," *Proc. IEEE* 58 (July 1970), p. 977.
12. Ibid., p. 976.
13. Ibid., p. 978.
14. Geller, op. cit.
15. Ibid.
16. Ibid.
17. Ibid.
18. Ibid.
19. Ibid.
20. Ibid.
21. Ibid.
22. Ibid.
23. Ibid.
24. Ibid.
25. Ibid.
26. Brenner and Price, op. cit., pp. 9-6 through 9-8.

CHAPTER 3

SANDFORD F. RANDOLPH

Sandford Randolph served as general manager of the cable television system in Clarksburg, West Virginia, from its inception in 1953 until he retired in 1976. The Clarksburg system and its sister system in neighboring Fairmont were defendants in the critical copyright case known as United Artists Television Inc. v. Fortnightly Corporation. Randolph served eight years on the National Community Television Association Board of Directors. He became its last elected president and first elected chairman in 1960–1961. He was a charter member of the Cable TV Pioneers and served as its executive secretary until his death in 1999. Sandford Randolph's story is told largely from his Oral History interview by Marlowe Froke in November 1987.[1]

PERSONAL HISTORY

Born in the college town of Salem, West Virginia, on April 5, 1913, Sandford Randolph was part of the renowned West Virginia Randolph family. His carriage and manner of speaking were reminiscent of the powerful former U.S. Senator Randolph of West Virginia. He lived across the street from Salem College, which at that time was a small, Seventh Day Baptist denominational school. He graduated from high school in 1930, in the depths of the Depression, and graduated from Salem College in 1934, with both bachelor of arts and bachelor of science degrees. "You couldn't afford anyplace else," he said. He worked for two years as student manager of the football team to pay for his tuition: $35 for sixteen credit hours. Since 1946, he served on the board of trustees of the college.

After graduating in 1934, Randolph worked for C.C. Keys in Clarksburg, selling refrigerators on commission. He said, "I sold three refrigerators in three months, and the commission was $8 and another one that was $10. By golly, I remember selling Mrs. Young one that had a light in it. I made $12 on that deal. This is when refrigerators were coming in and replacing the icebox. [At that time] Crosley [manufactured] a chest-type refrigerator that had two round metal tanks with a tie in between them, like saddlebags. The interesting thing was that this sat over the edge of the refrigerator chest. There was a small flame under the one on

the outside, and some way or another that drove the fluid to operate the refrigerator. When this thing ran out, you turned those tanks around and the refrigerant ran the other way. As we went along in those early days, we saw an awful lot of change. A lot of ingenuity."

For some time, Wierton Steel Company had been shipping metal to its Clarksburg plant to be tin-plated. According to Randolph, somebody who didn't feel kindly toward the Clarksburg community said, "Look, this is a waste of time. We can tin it up here in Wierton just as well." So, the Clarksburg plant closed down. Randolph said, "I left when the town collapsed. When Wierton Steel closed the tin plant, there weren't any jobs in Clarksburg. ... I helped a man move his domicile, and he gave me $12. I decided to go to Washington [D.C.] to see if I could get a job. I had $11 when I arrived in Washington. ... Before going to Washington, I had worked for WPA [Works Progress Administration] putting rock on roads. I got two days a month, $2.40 a day."

The Shannon family, with five youngsters in Randolph's age range, had lived in Salem and took in roomers. When Katherine Shannon and Sandford Randolph were juniors in high school, the Shannons moved to Washington and established a boardinghouse there. Randolph said, "I was never in [the boardinghouse], because on our senior class trip to Washington, they invited some of the kids over but they didn't invite me. I was a little hurt, so when I went to Washington, I was very, very definitely going to have nothing to do with them." People had warned Randolph about how tough the cities were. As he hitchhiked into Washington, the closer he got the more he began thinking, "Maybe I ought to be with somebody who knows me."

The Shannons by then had about eight houses, with rooms for sleeping, on Connecticut Avenue, half a block from the National Zoo. There was also one central dining room adjacent to and part of the old Russian Embassy. They had room for 175 guests. Randolph said. "I started walking up Pennsylvania Avenue from the White House. It was a long walk, so I finally decided to invest 7 cents in a streetcar and went out. They greeted me with open arms. They said, 'Don't you worry about any money until you get a job.' It was six weeks before I got a job and, of course, another two weeks before I got any pay. Then when I got my money, I paid the dollar a day I was charged for room and board. ... There were three or four nice, big boardinghouses in Washington like the Shannon's. They had linens on the table. There were individual tables for seating four or six. There was always a good choice for breakfast and dinner. You always had a choice of three entrees for dinner, and you always had soup. For a dollar a day, you were living pretty high on the hog."

Randolph's first job in Washington was as a clerk for the Agriculture Adjustment Administration (AAA), in the Old Post Office Building. "In those days," he said, "you took with you a letter from your Democratic committeeman. That became a part of your portfolio, and that qualified you. The [Roosevelt] administration passed out a lot of patronage jobs. ... Of course, at the end of a sixty-day

appointment, I was through. They hoped to pass jobs around as much as they could, hoping you would get discouraged and go back home. When that first appointment was up, I went down to Woodward and Lothrop [department store] and got a job for the holidays, selling toys. That was sort of interesting."

Randolph then got another sixty-day appointment to the AAA. He said, "Jim Farley was the head guy, the postmaster general. He was the guy who was ultimately responsible for passing out the patronages. That was the primary job of the postmaster general in those days. I never did meet him. While I was out of a job, I went up to the Reconstruction Finance Corporation where a fellow named Percy Bird worked. He was our West Virginia state [Democratic] chairman. I told him what was happening. He said, 'Sandford, I don't know what we can do today because Jim is out of town.' I had to realize that I was appointed by the assistant to the president of the United States."

Virginia Thompson was born at Wolf Summit, which is halfway between Clarksburg and Salem, and was only six months old when the family moved to Clarksburg. Sandford Randolph was a freshman at Salem College in the spring of 1931 when he met Virginia at Nelson's Drug Store in Salem. Virginia entered Salem College in the fall of that year. Randolph said, "I went to Washington in September of 1934. Then she came down in June after she graduated in 1935. We got her a job with Agriculture also. She was a secretary and made $140 a month, and I made $120. We got married, Christmas 1935."

The interviewer asked, "What prompted Virginia to come to Washington?" Randolph's unequivocal answer, "Love! Love! Love!" The Randolphs lived in Washington for several years and came back to Clarksburg in 1939 to accept an offer to work with a newly organized health insurance group. He said, "We sold hospital insurance. I had a drawing account of $25 a week. It was a commission job." In about a year, Randolph took over the business, which he kept until about 1956.

NAVY EXPERIENCE

Randolph said, "Virginia and I had a little fellow who we lost when he was twenty-eight months old. ... [It was] strep throat and doctor's neglect. It turned out that the pediatrician was on dope. I raised hell with some of my medical friends, but the medical profession doesn't police its own very well. That's the unfortunate thing, and I suppose it still exists. We called him Sandy—Sandford F. the second. He was a real joy.

"That made me 1-A," he recalled. "So, rather than be drafted, I went down to Charleston and got a commission, as lieutenant, junior grade, in the Navy. ... The Navy claimed that they worked it so that one-third of the people were on active duty or duty that was productive war business; one-third were in training; and a third were chasing ships. You got your orders in New York to pick up your ship in San Francisco, knowing damn well that when you got there, your ship would be gone. Then they would send you someplace else.

"After my indoctrination," he said, "everybody my age went into armed guard duty. I went to Camp Shelton, Virginia. I spent two months down there. The armed guard had the guns on the merchant ships. I understand that we shot down more of our own planes than enemy planes. ... Then I went to New York to the Armed Guard Center for the Atlantic. That was an interesting thing. You just spent your time watching movies and doing whatever. ... I went to Miami for two months. ... I came back to minesweeper duty at Cape May, New Jersey—sweeping the approaches to the Delaware Bay. I lived there at the Atlantic Hotel, which the Navy had taken over. They had beautiful table service there and everything was pretty nice.

"The first day [at Cape May]," he said, "All they could talk about was having a summary court for the 'Indian.' The boat had just come back from Anzio Beach in Italy, and this kid they called the 'Indian' had given them all kinds of trouble, and they couldn't do much with him aboard the ship. They waited until they got back and had a summary court. They were going to land on him just about right." The second day he came aboard, the captain said, "Randolph, I have a job for you." Randolph said, "What's that?" He said, "Defending the Indian." And Randolph replied, "Well, you're going to be sorry." The captain asked, "Why?" And Randolph said, "I'll get the kid off." But the captain insisted, "No, no, we're really going to pin it on him this time."

"We went out to sweep, and I spent the day preparing my case," Randolph recalled. "We got back in early and convened the summary court of three naval officers at, maybe, 3:30 or 4:00 PM." On the way over, Randolph stopped the legal officer and said, "I'm not familiar with naval courts and boards. Is there such a thing as a directed verdict for the defendant?" He said, "No, there is not. Why do you ask?" Randolph then told the legal officer, "I'm defending the Indian." To which he replied, "Boy, we're going to hang him. We're going to fix him."

The first thing Randolph did was to suggest the segregation of witnesses so they wouldn't parrot each other. The officers didn't know what he was talking about. So Randolph explained, "I don't know anything about naval courts and boards, but I know that in civil court you do this." So they said, "Fine." They got all the witnesses out and Randolph said, "The kid had three charges against him. He had forged a pass to get by the Marines to get out on liberty. He had come in drunk. And he had neglected to stand his watch. I had prepared the case pretty well. The junior officer on the prosecution hadn't done anything." After Randolph raised two or three objections, and the court ruled, he said to the girl who was the court reporter, "Are you recording my objections?" When she said, "No," Randolph knew he had the thing whipped. The court broke and the officers went out for a smoke. One of them asked, "Randolph, where do you practice?" He replied, "Practice what?" "Law." Then, Randolph said, "I'm not a lawyer." When the officers said, "We thought you were," Randolph knew he was going to get along pretty well.

Randolph never did put the Indian on the stand, because he knew he would goof up. When they got through, he said, "That's it, is it? Aren't we going to

argue?" The judges said, "What do you mean argue?" Randolph said, "I don't know anything about naval courts and boards, but ordinarily the prosecutor makes a statement, and then the defense lawyer makes a statement, and then the prosecutor has the opportunity to rebut." They said, "All right." But the prosecutor didn't have anything to say, so Randolph made it plain what the testimony had shown. Then, after waiting for the court to deliberate, Randolph said, "By golly, they came back in with specification one: not guilty; specification two: not guilty; specification three: not guilty. Well, the kid just went wild. He said to me, 'Lieutenant, I'm never going to plead guilty again!' "

The next day, Randolph went by the legal office where the reporter and the prosecutor were writing the report that would go in the boy's file in Washington and asked for a copy of that report. When they took the copy for the record over to the legal officer for signature, the officer tore it up. "So," Randolph said, "I have in my possession the complete proceedings, and this is the only record of it. That was a very interesting experience. ... I always wanted to be a lawyer. It beats working for a living. While in Washington (1934–1939), I worked mostly at night, either 4 PM until midnight, or midnight until 7 A.M. A lot of people I worked with went to night school, law school at American University. I always wished that I had done that, but I goofed."

After Cape May, Randolph was sent to Treasure Island in San Francisco. After a week or so, he picked up a ship headed for Seattle to be loaded with ammunition for an invasion, supposedly above Okinawa. "We laid at Eniwetok for thirty-seven days," Randolph said, "and then got orders to move up to Guam." Before they got to Guam, they were ordered to proceed on to Saipan to await recall. Randolph said, "We got to Saipan the next morning, and when we were steaming in, these B-29s started coming back. That was the last bombing other than the atomic bomb. ... There were two B-29 strips on Tinian and one on Saipan and two down in Guam. That's where all the B-29s were. We saw about 60 percent of them coming back in. Any time you would look up from the ship, you could count at least twenty-five of them—one right after the other." Randolph wrote to Virginia, "After what I have seen, it will all be over in thirty days."

"Well," said Randolph, "ten days later they called us down to Guam to discharge our cargo, and while we were there, the war was declared over. We had a big celebration on the ship and had grain alcohol, of course. We used brown sugar and melted it down with grain alcohol and we had pretty good drinks. That was the false alarm. The next night when it was actually over, I slept through the whole thing. The ship next to us spilled oil and had a fire, and I didn't know anything about it." Randolph said in his interview, "I always regretted that we dropped the atomic bomb, because I think that if we had dropped a sack of flour, it would have been more humane, and we would have gotten the same results. The Japanese were just waiting for some opportunity to throw in the towel."

"Ginny Ann was born while I was out on the Pacific," Randolph said. "I had told Virginia to let the Red Cross know. One night, I'm lying on the bunk, and I

see the blinker flashing ANTK, ANTK [our call signal]. We hung on the hook all the time because we had ammunition. So I got the signalman and he read it and that was how I found out that Ginny Ann was a week old. ... Karen was three years later."

He was discharged in Washington in 1946, as a full lieutenant and an insurance officer. He came back to Clarksburg and his family, became a trustee of Salem College, and went back to his insurance agency. He did some work as an American Legion service officer, helping members with their claims and so forth.

CABLE TELEVISION COMES TO CLARKSBURG

The American Legion had a bar on the second floor of the old house used for headquarters in Clarksburg. Randolph told them, "We are not going to get any of these World War II boys who had been around the world and had seen nice things. That bar on the second floor was not going to be any attraction to them because they had seen better." They said, "Well, what do we do?" Randolph suggested moving it down to the basement. They said, "We can't. There is only six feet of headroom." And Randolph said, "Well, let's make more headroom." They said, "See what you can do."

Randolph got in touch with Clyde Shrum, a contractor. He said, "We went in there and we cut under the twenty-four-inch stone wall that made up the foundation. We took out four feet of dirt and extended the walls down into the ground enough so that we had a good nine feet of headroom. We put in a nice, beautiful, up-to-date bar and a poker room. It was my first association with Clyde Shrum." Then, one day Shrum called to say he had a franchise for prefabricated homes being produced by National Homes of Lafayette, Indiana. He wondered if Randolph would like to go to Lafayette with him and Jack Fleming to evaluate the product. "So." Randolph said, "the three of us went out to Lafayette, Indiana, and saw the first Thrift Home that National had built. ... We thought it was very impressive."

Before the end of the year (1950) Randolph went to Shrum and said, "I'm wasting a lot of time. I want to work a half day with you in construction."

Shrum asked, "What can you do?"

Randolph replied, "Well, I can expedite materials. I can do some running for you."

"How much money do you want?"

Randolph said, "Well, I ought to have at least three dollars an hour."

But Shrum said he couldn't pay that. Then, a couple of days before January 1, Shrum called and said, "Come on down, we'll talk."

Randolph said, "I've always been interested in the construction business, and this was a good opportunity." And so, in 1951, he began to work selling Thrift Homes, priced in the range of $5,000. The first one he sold was deluxe, for $11,000. He said, "In two and a half years, we sold about a hundred or more houses. ... These people just took my word, and I hold that very, very valuable. I sold $40,000 worth

of houses without anyone ever seeing one. I told them it was a good buy, and it was proven to be. People bought them on my say-so. I did all the selling and the financing on them, and the expediting. It was an interesting experience."

Then, in 1953, Wrede Petersmeyer and Charles Brown, for J.H. Whitney and Company, and Jim Rogers, for Fox Wells, came down to Clarksburg from New York, and there was a lot of talk about building a Cable TV system. Randolph said, "It had no interest to me. At the 1933 [Chicago] World's Fair, I had seen a television exhibition and demonstration, and at the 1939 World's Fair in New York, I had seen it again. There was no TV in Clarksburg. There was only one station in Pittsburgh, and that was Channel 2, the old Dumont station WDTV [later changed to KDKA]. That was the only station that had a chance of getting in here, but it wasn't watchable. I had no interest at all. Mr. Highland, who owned the local newspaper and controlled the Empire Bank, ran horrible stories in the paper about how these people had applied for a franchise. He showed pictures of amplifiers on poles, and the amplifiers would be shown as two- or three-ton things, four- or five-foot cubes, and they were in danger of falling down and killing people. That was the kind of war he waged."

One day, Randolph got a call from Luther Berry, the head of Union Bank, and George McQuain, the bank's lawyer. "Interesting thing," said Randolph. "They [Petersmeyer and Brown] were looking for a manager. They had interviewed everyone in Clarksburg who was unemployed and looking for a job. Their next step was to ask Luther and George to line up some people who were successfully employed and might like to venture into a different field. Luther Berry called me, and it happened that Charlie Brown was in. So I went over. I thought maybe I could learn something, but I wasn't interested because I had the insurance company in the red that I needed to work on. Much of the meeting was spent with Brown making inquiries about prefabricated housing."

Brown said, "Why don't you write me one page on why you think you might want this job?" He did that and took it back to the bank, to Berry. When Randolph got home that evening, Virginia said, "Luther called and said he wants to have breakfast with you in the morning." Randolph recalled, "I met him, and before we went into the dining room, he offered me the job for $6,500 a year, and I grabbed it!"

That was the beginning of the Clarksburg cable television system. The rich and famous "Jock" Whitney was the principal in the venture capital investment firm known as J.H. Whitney and Company; George Wells, sole heir to the American Optical fortune, was a principal in the venture capital investment firm known as Fox Wells. Randolph said, "These two people got together and put in a little bit of money. In fact, they gave me $150,000. That's all the money that was ever put in the Clarksburg system. Just when I got down to the last $5,000, with arrangements at the bank to borrow whatever else we needed, we got into making taps [connecting customers] and into service."

Randolph explained, "In those days, we charged $125 for the hookup, and then there was a federal excise tax. I think it was 6 percent [actually 8 percent, which the U.S. Court of Appeals, in 1957, declared inapplicable to Cable TV], and then you had state consumer tax. So, it was $137.50 that people paid." During the Depression, the federal government sought to encourage electric and telephone utilities to extend their lines out to the small towns and farms. To help with the highly unprofitable expense of building plants in the sparsely inhabited rural areas, the hook-up charges could be treated as "contribution-in-aid-of-construction" and would not be taxed as ordinary income. Randolph pointed out, "Of course, we must always remember that the cable company is not a utility." Nevertheless, as he said, "That was the basis on how so many people were able to get into a very profitable business without any capital." By 1958, when the Appeals Court invalidated this concept, other sources of financing had become more available.

Later on, *Time* magazine published a story about Mr. Highland and his newspaper's crusade against cable television. Randolph said, "It was a very unkind thing, and if my people at Whitney had anything to do with *Time* carrying it, I was very ashamed of them. ... [Mr. Highland] was afraid of losing readership. That would be the whole thing. The man owned the newspaper, and he could do what he wanted to do with it. *Time* magazine carried a story later on his death, and the article referred back to that thing. ... Mr. Highland was fighting the issue on the franchise. Of course, there was no television station here in Clarksburg. He was a blessing to us because he fought [bringing] the television station [into the market]. We had 4,000 customers before the television station came on the air [1957]."

Even before coming to Clarksburg, Whitney and Fox Wells financed a system in Williamsport, Pennsylvania. Randolph said, "I had heard about coaxial cable that the telephone company was using experimentally in Virginia. It was a hollow core with spacers and a center conductor. I couldn't figure out how you could hook that thing up to a television set. I went up to Williamsport to see Ray Schneider, the manager up there. Kip Fletcher, a Jerrold engineer, was there. He was one of the finest people I have ever known. He taught me what little technical stuff he could. At that time, Randy Tucker, who lives down in the Charlotte area, and his brother-in-law, Doug Talbott, had been the distributor for Jerrold out of Pittsburgh. It wasn't going too well, so they split company. Randy went with Jerrold down in Philadelphia. Doug came here [Clarksburg] as our field engineer."

Whitney and Fox Wells also financed a Cable TV system at Fairmont, a slightly larger city about thirty miles north of Clarksburg. The Fairmont system began operation a few months before Clarksburg. At first, Randolph was responsible only for the Clarksburg system. Ned Pence, whose father was president of Fairmont College, managed the Fairmont system. Randolph said, "Ned never did think it would get off the ground. He was very pessimistic about this, and indeed he never thought that the people would pay $3.50 a month for any kind of service like this, even though there wasn't any other service available. He had to be

replaced. In the interim, while we were looking for a manager there, I took care of Fairmont. Then we hired Bertram 'Boots' Cousins Jr. ... Boots' background was like Harry Truman's; he was a haberdasher. His family owned Hartley's Department Store. They had been there a long time. When we contacted Boots, he was selling neckties. ... Boots has done a fine job. ... He has only recently retired [1987]."

THE FORTNIGHTLY CORPORATION

Not long after starting the Clarksburg and Fairmont systems, according to Randolph, Fox Wells bought out the Whitney interest and transferred the ownership of the Clarksburg and Fairmont systems to the Olympic Development Company, a subsidiary of American Optical, owned by George Wells. He said, "Fox Wells went down to build [the system in] Muscle Shoals, Alabama. J.H. Whitney went out west and built three operations in the state of Washington: Walla Walla, Wenatchee, and Richland."

As Randolph told it, the subsequent sale of the Clarksburg and Fairmont systems to the Fortnightly Corporation, and the entry of the Rosenwald family into cable television, came about in the course of some casual "networking." Jim Rogers, of Fox Wells, was on the board of directors for a scientific magazine with Nathan W. Levin, who managed the finances for Marion Ascoli, daughter of Julius Rosenwald, the founder of Sears Roebuck. Randolph said, "During a coffee break [at one of the board meetings], Mr. Levin asked Jim if he knew of any properties that might be available that would throw—I think the figure was $100,000 a year." Rogers told Levin the next day, "We've got a little company down in West Virginia that you might be interested in. It's a TV cable company, and that's sort of an interesting new thing."

According to Randolph, "That is what happened. ... The ownership of Clarksburg [and Fairmont] ... went over to Fortnightly Corporation, which was the corporation of the Ascoli and Rosenwald people." Marion Ascoli was first married to Dr. Stern and then later was married to Max Ascoli, publisher of the *Reporter* magazine. Randolph said, "Max Ascoli is an Italian political science guy who made speeches against Mussolini and had to get out of the country with only the clothes on his back. He came and charmed this young lady and they were married. Marion and Max Ascoli are both charming, charming people."

Randolph said, "The *Reporter* was a high class thing. The problem was that we didn't let too many people back in the hills realize who owned the cable system. It was a little pinkish [leftist]. And of course, they used some of the profits, or all of the profits [for the *Reporter*], when Clarksburg fell into [their bailiwick]. They got along pretty well with it until the Internal Revenue Service came in." After the IRS interview, Randolph asked, "How did you get along with the lawyer?" and they said, "Fine. The IRS came." Randolph was in New York, and said, "Ten days later, they got a deficiency [notice] for back taxes of a million dollars that they owed. [The IRS] said that the *Reporter* magazine was a rich man's folly

and not a business venture. ... [The Ascolis] paid the million dollars. That was one of the interesting things that happened [to come] along in the business world."

In June 1960, United Artists filed suit against the Clarksburg and Fairmont cable television systems, in a case known as *United Artists Television Inc. v. Fortnightly Corporation,* charging Fortnightly with illegally picking up broadcast television signals, including programs produced and copyright by United Artists, then selling those programs to customers (see Chapter 2). This was critical litigation, with potentially disastrous implications for the young cable television industry. In the course of the litigation, Fortnightly sold the two systems to Jack Kent Cooke's American CableVision, which merged first with H&B Corporation to become H&B American, and then with TelePrompTer, controlled by Irving Kahn, a prominent financial spokesman for the cable television industry. The National Community Television Association (NCTA) agreed to finance the legal costs of the litigation and retained its former general counsel, E. Stratford Smith, to participate, as special counsel, with the New York firm, Cleary Gottlieb Steen and Hamilton. Lead counsel was Robert Barnard, Washington partner in the Cleary Gottlieb firm.

Smith said, "We undertook to establish that under our commercial system of broadcasting, the copyright owners had already been paid by the advertisers for the right to broadcast and that, once broadcast, the programs were intended by law to be received for private viewing. Cable TV was simply the receiving mechanism—not a performer or seller of programs. In preparation and brief writing, we were meticulous to make certain that not a word, phrase, or sentence we wrote in the briefs was inconsistent with our master antenna concept, that Cable TV was simply the receiving mechanism, not a performer or seller of programs. During our working conversations for eight years, we lawyers corrected any one of us who slipped up on our terminology. In confrontation, it is an absolute of one-upmanship that you define the terms, refuse to use any others, and pressure your opponent to slip into your lexicon."[2]

Randolph was the general manager of the two systems that had become defendants in the litigation. Smith said, "Fortunately, the two systems were classic community antenna systems. Throughout the litigation, Randolph fretted because we would not let him add microwave channels to his system." It became critical that witnesses use the term "master antenna" and speak of delivering "signals," not "programs." Smith said, "A problem with Cable TV operators in those days is that they fancied themselves as being in show biz—and that included our good friend and secretary, Sandford Randolph, who was one of our principal witnesses. He worried years off our lives because he was more likely than not to phrase his answers to the questions we had prepared for his direct testimony and in mock cross-examination as if he were in the business of selling programs to his subscribers.

"It was also my non-legal and exasperating responsibility," Smith said, "to get the industry to hold the line on the master antenna concept. As the years were

going by, the industry was changing, and many were fretting under the yoke of master antenna. To some of them, I was a negative force in the industry. But we could not afford to lose that case, because every operator would be subject to triple damages for every infringement going back several years."[3]

Randolph attended his first NCTA convention in 1954. He became quite active and served eight years on the board of directors. But, with the *Fortnightly* case imminent, Randolph said, "Strat Smith ... thought it best that Bill Adler [of Weston, West Virginia] and I resign from the NCTA board upon which we served. This was because we were the only two people on the board who were in the jurisdiction to be served papers by the federal government on the lawsuit." At the time, Randolph was at a meeting in Pittsburgh. He said, "Bill Adler was down where he and I and some others had an operation in Covington-Clifton Forge, Virginia. ... We called him and didn't tell him what the purpose of the call was, but just told him to get to Pittsburgh as quickly as he could. He drove all night and got there about four in the morning. Bill and I resigned from the board for that purpose. That's one of the only things that I have ever been asked to resign from." In 1960, after the court papers had been served, Randolph was elected to what would be NCTA's last unpaid president. In January 1961, NCTA hired its first professional president, and Randolph became chairman of the board. He said he never went back as a director.

Extensive depositions for the lawsuit went on for weeks at a time in New York City. Randolph said, "I never did [appear in court]. Everything was done by deposition, and my deposition covered sixteen days. Boots [Cousins] and I took [sic] depositions. ... When they were doing these depositions, there was a West Virginia cable meeting at the Greenbriar [resort], and I was there. All my friends were worried about me. I was not myself at the Greenbriar." Strat Smith had said, at one point, "Sandford, you must be careful of what you say. You can't win this case, but you could lose it." Adler went to Smith and said, "What did they do to Sandford in Washington? Something's wrong." Randolph explained, "[The attorneys] work pretty hard. They never did tell you what to say, but you measured your words pretty carefully. We were under a lot of nervous tension. That's what did it. It killed my old spirit for a while."

After eight years of preparation and trial, the case finally reached the U.S. Supreme Court, after losing in the lower courts. The attorney for United Artists at the Supreme Court hearing was the renowned Louis Nizer. Justice Potter Stewart read the astonishing opinion of the Supreme Court: that Fortnightly had not infringed on United Artists' copyrights. Strat Smith said Nizer's partner, Gerald Myers, was so startled he involuntarily gasped a very audible, "Oh my goodness!" As Nizer and the other lawyers left the courtroom and were going down some steps, Randolph said, "Mr. Nizer, I'm the bad fellow in Clarksburg that you talked about, but I'm not really as bad as you painted me."

Henry Geller, FCC general counsel at the time, said, in his Oral History, "Nizer did a very bad job of arguing the two [*Fortnightly* and *Southwestern*]; it antagonized

the court. He insisted on sticking to his way of presenting the case, and he simply never got around to arguing the performance point. He irritated them very much."[4] In his Oral History, Randolph said, "[Nizer] was a little bow-legged fellow, and he did a pitiful, pitiful job, everyone agreed. ... We won that thing and that set the stage for what goes on today."

THE NATIONAL COMMUNITY TELEVISION ASSOCIATION

Randolph said, "I don't know if there was ever a time that there weren't problems, because I think this industry has been put upon, perhaps more than any other, by jealous-hearted politicians who wanted to make it tough for the cable business." From its inception in 1952 until 1961, the NCTA was a largely volunteer trade association. Membership dues paid a small stipend for Smith, a full-time practicing attorney, to serve as a part-time executive secretary (later executive director), and for a full-time administrative assistant. Randolph said, "When in Washington in 1960 and 1961, I would help fold the bulletins we put out every Friday." By then, Ed Whitney had become the first full-time executive director, Smith had become general counsel, and there was an office assistant.

In 1967, even with the *Fortnightly* case still pending before the Supreme Court, the name was changed to National *Cable* Television Association, in spite of a warning by Smith that it could undermine their case in court (see Chapter 9). Randolph said, "We saw that the industry was well represented by the NCTA in Congress and in the states, and we made progress—perhaps more real progress than has been made since then." The name was changed again in 2001 to National Cable *Telecommunications* Association.

Unfortunately, some operators managed to create political problems for the industry. Randolph told this story: "I think at about that same time (1953–1954) one of our operators in the southern part of West Virginia enjoyed fooling around with the cable system. It was a plaything for him, and every morning he'd have the cable off, doing something—this, that, or the other—without any concern for whom he might be disturbing. So, a lady called in one morning and said, 'Do we have to put up with this disruption in service every morning without any consideration for us?' The operator was very frank and earnest, if somewhat lacking in diplomacy, and said, 'If you don't like the service, just don't pay your bill and we'll cut it off.' "

Randolph said, "It so happened, this lady's husband was in the West Virginia state legislature. So that was the first bill to put us under the Public Service Commission that ever came before the legislature. And I suppose that every session of the legislature since has had such a bill. So, it's a continuous fight, as it was this last session that just ended last Saturday night [October 1988]." But poor service was not the primary cause of customer complaints. Randolph said, "We used to go down and look at the complaints that the Public Service Commission had received. They opened the files to us, and they were twenty to one based on the fact that they could not get cable service. These were people out beyond where it

was reasonable to build a system. It was twenty of those to one of anything about service."

Asked by the interviewer to explain how the cable industry had won practically every important economic and legal decision in the past forty years, Randolph replied simply, "The man in the street wanted it. I think that is about it. The consumers were our friends. I think that has been the secret of it."

U.S. SENATE BILL S-2653

Smith said, "Several bills to regulate Cable TV had been introduced in both the House and Senate of the 86th Congress [1959–1961] by several members of Congress, immediately following publication of the Cox Report." This was a staff report released late in 1958. Prepared by Kenneth A. Cox for the Senate Commerce Committee on Interstate and Foreign Commerce, the report discussed the problems of television service for small communities. Smith continued, "NCTA asked me to draft a bill, and a committee of operators worked on it. It was approved by the NCTA board and was introduced as Senate Bill S-2303. ... [It] proposed to confer general licensing authority over Cable TV in the FCC ... It prohibited protectionist regulation in favor of the broadcasters, and it rejected retransmission consent. It was not acceptable to the broadcasters."[5] After hearings chaired by Senator John O. Pastore of Rhode Island, the subcommittee staff drafted a bill of its own, introduced as S-2653. The industry was mobilized to lobby in support of the bill, with some negotiated modifications. Then Milton Shapp, president of Jerrold Electronics, and Henry Griffing, owner of an Oklahoma theater chain who was experimenting with pay Cable TV, organized opposition to the bill and caused NCTA to withdraw its support. Shapp and Griffing argued impressively that the industry should not want to be regulated at all. Yet the bill had been approved by the NCTA board on the premise, in part, that the Cable TV industry would be in a stronger position in its struggles with broadcasters if the FCC was made responsible by law for regulating both industries in the public interest.

Having been mobilized in support of Sen. Pastore's bill, the industry was sharply divided. Shapp and Griffing rallied members, who swarmed through the halls of Congress opposing the Pastore bill, which had so recently been supported. Smith said, "The debate [on the Senate floor] was bitter, and the bill was defeated by one vote" (see Chapter 7). Whether the outcome was favorable, as some thought at the time, or a defeat, as others believed, can be argued endlessly. Randolph said, in his Oral History, "[Senate Bill 2653 was] perhaps the first time that we almost got caught in the FCC regulation." Smith said, "I now think the S-2653 fiasco was nothing more than an incident in the development of cable." Nevertheless, the industry's credibility in Congress suffered a severe setback. Several important senators, who had been sympathetic, declared they would not again be out front on behalf of the industry.

IN THE COMPANY OF FRIENDS

Randolph said, "I had been on the NCTA board for eight years. I always gave Ralph Shepler [an Elkins, West Virginia, operator] credit for having moved me into the presidency of the thing. He was on the board as well. Ralph, Mary Frances [Shepler], Virginia, and I used to have a great time traveling around. I'll never forget, we went down to New Orleans for a board meeting. We drove down. We drove two days. We were there two days and drove back in two days. We ran into a snowstorm in Birmingham. The fact of the matter was that they had snow in New Orleans, the first since 1926, and the biggest one since 1889. It was a very, very short meeting!"

When the meeting was about to adjourn, at three o'clock in the afternoon, Randolph said, "Is this going to be the end of it?" George Barco, who was president at the time, said, "Is there anything else?" And Randolph said, "Well, ordinarily we spend some time on the second day exchanging information and so forth, with discussions and things." Barco said, "Well, how many would like to have a session in the morning?" According to Randolph, the response was 95 percent in favor. None wanted to miss out on the expected conviviality between meetings. So Barco then told Ed Whitney, "Let's work it out that we eat dinner together."

So they ate at the Roosevelt Hotel. Randolph said, "Jan Garber was playing in the Rainbow Room. So we went in there, and of course everybody had a couple of drinks, but George, not being a drinker, didn't. That was the first time NCTA ever picked up any expense for any members or officers. George Barco was aghast at a bill for $600 for that dinner. I don't know whether he's ever gotten over it. ... But that was a lot of fun, a lot of fellowship. You see, we used to go out after these board meetings and spend the evening talking and visiting. I understand that now, when the meeting's over, it's 'Boom! Goodbye!' until the next session."

Stan Searle was publisher of a trade magazine called *TV Communications*, later called *Cable Television Business*. Randolph said, "At the national convention of the NCTA in 1966 [in Miami], *TV Communications* honored twenty-one people who had rendered some service to the industry or the NCTA. Fortunately, I was so honored. The selection at that time was merely from a committee, an undisclosed committee. I don't think anybody knows yet who chose those people. But they were twenty-one early leaders in the cable business. [Searle had asked NCTA to suggest appropriate names.] Those twenty-one then decided that they might be of some further service to the industry if they collaborated. So a dinner was set up at the next NCTA convention in Chicago. ... Since then, each year, each existing member has an opportunity to nominate one person who they feel has contributed either to the industry or the association and has been in the industry for at least twenty years." In 1989, the Cable TV Pioneers was formally organized. Randolph served as executive secretary of the Cable TV Pioneers from his retirement in 1976 until 1996. For twenty years, he served as master of ceremonies at the annual Pioneers Dinner, an imposing

figure always wearing an elegant gold-colored jacket, widely known as Randolph's Gold Coat. He died in 1999, at his home in Bridgeport, a suburb of Clarksburg.

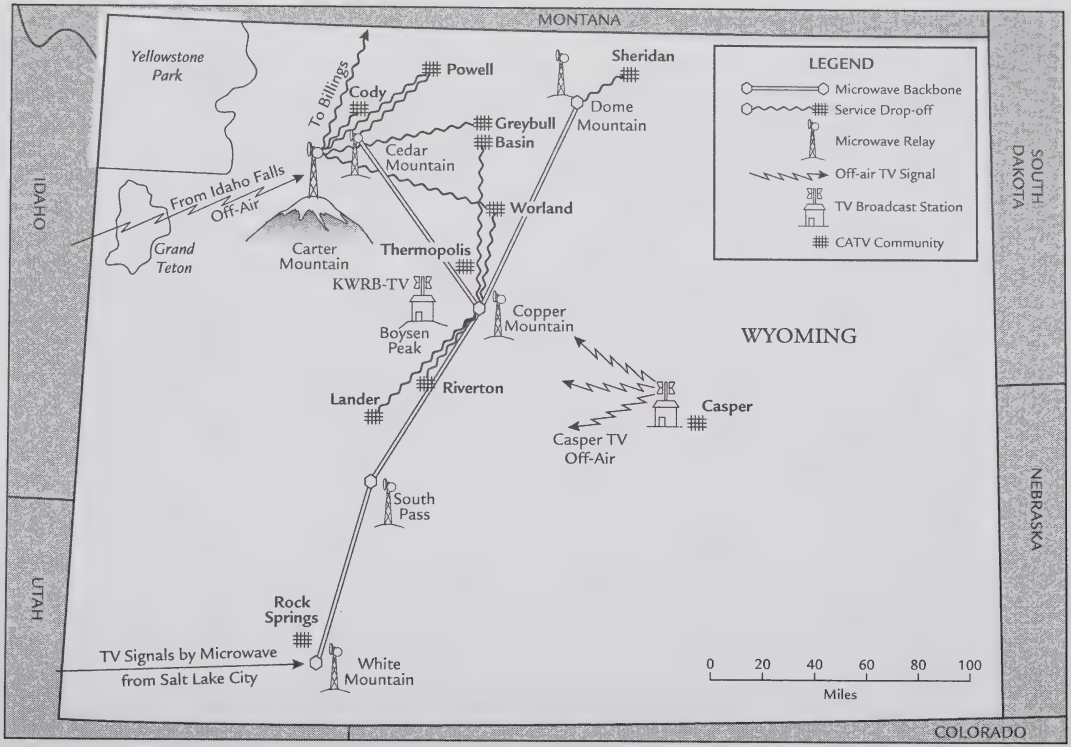
GEORGE SPELVIN

The Cable TV Pioneers organization sometimes took on the appearance of a bunch of sophomore fraternity brothers. The admission of George Spelvin into membership in the Pioneers in 1967 sparked a rare and emotional controversy among the members. According to Randolph, "The thing was put together by [Charter Pioneers] Bill Adler and Ben Conroy." One of the pejorative allegations was that George Spelvin had placed a video camera in the window of his Cable TV office, focused on the liquor store directly across the street. The image was fed to subscribers throughout the cable system. Randolph said, "Liquor sales fell off about 50 percent, and of course, George said all he was doing was what the FCC wanted the cable companies to do—things of local interest." Randolph said, "I think it would shape up as one of the best hoaxes ever perpetrated upon any group. We do have the Spelvin Papers in The Cable Center. It is a set of the voluminous correspondence that relates what people's feelings were about George Spelvin, who, by the way, at the end of the story turns out to be a fictitious character. It so happens that George Spelvin is a name that is used in the theater when one person plays two parts. The second part is listed in the program as being played by George Spelvin."

A second, genuine controversy erupted over George Spelvin at the Pioneers' formal black tie dinner at the NCTA convention in Boston in 1968. An impromptu business meeting was called to order, at the dinner table, for the purpose of deciding on the expulsion of George Spelvin. After humiliating several unwitting victims, the hoax was exposed. The victims, and some others, did not take it kindly. Stunts of this sort have not been repeated.

NOTES

1. *Sandford F. Randolph, An Oral History*, interview by Marlowe Froke, November 1987 (Denver: The Cable Center).
2. *E. Stratford Smith, An Oral History*, interview by Pat Parsons, March 1986 (Denver: The Cable Center).
3. Ibid.
4. *Henry Geller, An Oral History*, interview by David Paglin, November 1985 (Denver: The Cable Center).
5. Smith, op. cit.



Proposed Microwave Network
Carter Mountain Transmission Corporation

CHAPTER 4

ROY BLISS SR. AND TOM MITCHELL

Roy Bliss Sr. pioneered community antenna television in Worland, Wyoming, in the early 1950s. Together with his engineer, Tom Mitchell, they became the focus of the notorious Carter Mountain Transmission Corporation case that bedeviled the Cable TV industry for many years with must-carry and program non-duplication rules for the protection of local television broadcasting. His son, Roy Bliss Jr., and Larry Flinn were founders of United Video, providing satellite relay facilities for superstation WGN-TV, Chicago. The story of Roy Bliss Sr. and Tom Mitchell is told largely from their joint Oral History interview by E. Stratford Smith in October 1991.[1]

PERSONAL HISTORY

Roy Bliss Sr. was born on a farm in Bloomington, Illinois, to Emory and Ethel Bliss. He attended primary and secondary schools in Bloomington. After attending Illinois State University for a year and a half, he studied at a business college for another year and a half. Bliss then took a job as credit manager at a farm implement company in Peoria. With a low draft number, he volunteered for the U.S. Army Air Corps, where he served throughout the War. In 1942, he was assigned to Phoenix, Arizona, where he met the young lady who became his wife. After the War, in 1945, Bliss returned with his wife to her family's ranch in Wyoming, where he worked for his brother-in-law in an automobile agency in Gillette. A year or so later, the Blisses moved to Worland, where Roy started a Culligan soft water business. About 1982, their son, Roy Bliss Jr., and Lawrence (Larry) Flinn organized United Video Inc. to serve primarily as a "superstation" common carrier for satellite program relay from WGN-TV, Chicago. United Video also became a leader in the development of electronic program guides for cable television.

Tom Mitchell was born in a little town called Chandler, Oklahoma, to Thomas W. Mitchell Sr. and Elizabeth Mitchell. He graduated from Chandler High School during the Great Depression when there were no jobs of any kind. So he signed up for the Civilian Conservation Corps (CCC) and was assigned to Worland, Wyoming. After three years with the CCC, he went to Washington, D.C., and

spent five years in military service working in radar. Mitchell was trained in electronics and radio at the Coast Artillery Communications Schools and spent some time at the Massachusetts Institute of Technology (MIT) with an early radar development team. For the rest of the War, he was sent overseas to different places in the Pacific, experimenting with prototype radar built by MIT and Bendix. He liked Worland and after the war went back to work in an electronic repair shop for a year or so. He then started his own business as an electrical contractor, based in Worland.

CABLE TELEVISION COMES TO WORLAND

In November 1953, a new Channel 2 television station commenced commercial operation in Billings, Montana, roughly 130 airline miles north of Worland, with Joseph S. Sample as owner and manager. People were excited. Would they be able to get TV that far away? Down in the Bighorn Basin, Worland was surrounded by mountains. By this time, Roy Bliss Sr. had a small Cessna airplane that he used to get around that sparsely settled ranch country. Just for fun, he invited John Huff, a friend who had some electronic test equipment, to fly with him to see if they could pick up a signal in the air from Channel 2. He said, "I had to climb up to 8,000 feet before we could even get a weak signal. So we more or less gave it up." They left the equipment running while they headed back to the airport. As they were buzzing along a ridge west of town, close to a wildcat oil well drilling operation, Huff excitedly yelled out, "I've got a signal!" They were only twenty-five feet off the ground! So they quickly parked the airplane back at the airport and got Tom Mitchell into the act for some more looking.

Mitchell said, "When they built the first little TV station in Billings, Montana, I thought I was going to sell equipment and TV sets and antennas. So I bought this crank-up tower and all the paraphernalia to look for signals and didn't find any. ... It was about that time when Roy and John Huff flew around in that airplane and discovered that there was a viewable television picture out in the hills, five or six miles from town—the one and only [TV signal] in northern Wyoming. We soon determined that it was a knife-edge effect over the Pryor Mountains. It was not line of sight, but, due to a propagation oddity known as a knife edge or obstacle gain, the signal would strike the top of these mountains and then deflect down into that valley. There were only a few places where the correct conditions would occur for this signal to strike down into the ground. This happened to be five or six miles west of the town of Worland."

The footprint of this signal was very small. Mitchell surmised, "It was probably only a matter of a thousand feet in circumference—very small. There were no other usable locations, just that one place."

Bliss added, "Actually, instead of being horizontal, the antennas were pointed down, looking into that valley." Then he said to Mitchell, "You might mention how that 'dished' up to that ridge."

Mitchell explained, "It happened that we were also at the [focus] of a natural parabolic ground reflector, like a little bowl. And the strongest signals were only just about three feet off the ground. ... With that as a start and hearing about cable television in the Northwest, [we went out to look] at some of the operations in Walla Walla [Washington] and other towns that had started a cable system. ... [We visited] George Frese, an old name in the cable industry, and a man named Myron Sargeant, and we went to the system that was being built in Walla Walla. Anyway, we learned how to build a cable system."

"[Roy and I] had been in the Civil Air Patrol together and the Junior Chamber of Commerce," Mitchell recalled. "It was a small town. Everybody knew everybody in Worland, at that time anyway. ... In 1953, no one living in Worland had ever seen television—or maybe a very few had been in Denver or somewhere like that."

Then Bliss added, "We tried to get a TV set in Billings, but being so new, we couldn't even get a TV set there. So, we finally ordered one out of Denver—a Dumont. The next thing was: What do you do with it? We were out west of town—no electricity. So we put some funds in, and we built a little building, made a little theater-type thing—put an old couch in there, got a generator, and put that Dumont TV in there and started inviting the public out—four or five people at a time. You can't imagine the response we got."

Mitchell added, "It was just a dirt road, and by that time, it was wintertime!"

Bliss said, "We borrowed an idea from the power companies. They would get aid-in-construction—$150, you know. That's how we raised a lot of our money. At the beginning, the customer had to pay $150 as a contribution-in-aid-of-construction. ... It worked out very well for us at the beginning, because the bankers really didn't know much about cable, and they were very skittish about it. ... For a while, we both continued with our business, but it just kept taking more and more time."

Mitchell said, "I was the engineer and Roy did all of the business. I think we built that system with two men and myself, didn't we?"

Bliss agreed, "Yeah, but one had been with the telephone company, a good pole climber and all that kind of ... you know. We got good people to work for us."

Then Mitchell added, "Anyway, we had no trouble building the system. We had to go through all the telephone clearance problems, clearing the space on the poles and so forth. ... We rented [space on] the poles from the telephone company."

According to Mitchell, "The population of Worland at that time was probably 7,000, [perhaps] 2,000 homes. ... [Signing up customers] was slow, because we only had one channel. It came on at four o'clock in the afternoon. It didn't have a national [network] feed. ... It wasn't tape even; it was old kinescopes. And it signed off at probably eleven o'clock. No one had a television set, so in order to interest them in the cable, they first had to buy a television set. Television sets were much more expensive in those days than they are now [$2,500 in today's dollars]. We

didn't sell television sets. We left that to other people, more as a public relations thing than anything. But it was slow getting started. ... I remember it was late summer [1953] before we had 100 subscribers. ... We finally got into operation there early in the year of 1954." He said, "It was a matter of months—six or eight months—to build Worland."

Bliss said, "We got all of our financing right out of Worland from the local banks." Mitchell said, "One bank didn't go along, so we went to the other bank." They said, "If you can get that signal off the hill and get it into the community hall [in Worland], and I get a chance to see how the public is receiving it ... I'll go with you."

Mitchell said, "Well, we packed that [hall] for two or three nights ... and I guess the whole county was in that building. This was in May of 1953 that we put that show on. It [Cable TV] was so new and unusual that we got probably thirty or forty television sets—had a big community hall—set them around the circumference of that room. We got time on the air in Billings. I went to Billings and got on the air. Billings was very friendly—it was just some more coverage for them. That's the way the broadcaster looked at it in those days. Well, I took the head of the power company and the mayor [from Worland] and we told them all about the town of Worland and all about the cable industry, because no one—[not] even the people of Billings—knew about cable either in those days."

They started building the Worland system with the Amplivision broadband, distributed gain amplifiers built by International Telemeter Corporation, a Paramount Pictures affiliate.[2] According to Mitchell, "We started out in the very early days thinking that you could only carry one channel through one amplifier. In fact, the Jerrold company went through that for many years, but the difference was that some people, Telemeter among them, had decided that you could use broadband technology. So when we started adding channels, we didn't have to change that equipment. [For cable], RG-11/U was the only thing available in large supply anyway, and sometimes it was hard to get."

Mitchell said, "Worland was not the first system in the state of Wyoming. Casper was either with us or maybe a little ahead."

But, Bliss said, "We had the first picture at that community hall thing."

Mitchell added, "We may have had the first picture, but we learned a lot of things from the Schneider boys in those days."

Bliss agreed enthusiastically, "Yes, we did." Richard and Gene Schneider (see Chapter 10) were working with Bill Daniels to establish Cable TV in Casper at about the same time.

Mitchell said, "We were very close. I mean, we'd consult back and forth [with the Schneiders] almost daily—if we could afford the phone call!"

Expanding to Other Communities

Word spread that television had come to Worland. Bliss said, "The City Council came down [from Greybull and Basin] and demanded that we come up there." There were about 300 to 400 households in Basin, some thirty miles down the Bighorn River (north) from Worland, and twice that many in Greybull, eight or ten miles farther down the river.

After completing the Basin (1954) and Greybull (1956) systems, Bliss and Mitchell turned their attention to Thermopolis, a town somewhat larger than either Greybull or Basin, about thirty-some miles upstream on the Bighorn River and south of Worland. Thermopolis was too far for reception from Billings, but, in early 1957, a new station began operating from Casper, about 115 miles from Thermopolis. According to Mitchell, "[Thermopolis] was the only system we didn't do from scratch. There had been a system started there—it was hardly operable—and they ran out of money. They also had a radio station operation, but they couldn't manage both and got in financial troubles. Finally, the whole thing went to a sheriff's auction. We bought the thing, kept the cable system, and disposed of the radio station. So, we didn't really start that from scratch, but we had very little when we bought it [in 1957]."

Bliss and Mitchell continued to expand their operation. They established systems, first in Riverton (1958), about seventy miles south of Worland, then in Lander (1959), twenty-five miles southwest of Riverton. Both these towns are somewhat larger than Worland, with perhaps 3,000 households each. The six systems, with about 10,000 total households, were operated as Western Television Inc. Mitchell said, "I guess we were the only multiple system operator at that time. Sheridan had a system. Cody had a system by that time. Rock Springs was building a system. Laramie had a system. And Casper had a system."

Bliss said, "We had an office and a manager in every one of [our] systems, except that Greybull and Basin were together."

Mitchell added, "Just as small an operation as possible, but you had to have a local person. ... Bill Ross, who is well known in the cable business, was the manager and engineer and everything else in Riverton. ... In Lander, we trained Charles Jenkins, who later became the chief engineer for Daniels. ... In Thermopolis, we trained James Crouse, who became a multiple system operator in Illinois, until he sold out. In those days ... it so happened that we got hold of good people, who loved the industry and stayed with it. We also had a man named Leo Livesay, who was the manager in Mobile, Alabama, and Liberal, Kansas, for TelePrompTer. We had a number of people who started with us."

As they expanded, Mitchell said, "[Technology] was running away from us. Technology was ahead of us all the time. ... The amplifiers we used, luckily, were broadband amplifiers. So when we started adding channels, we didn't have to change that equipment. But the main tremendous gain was in the cable—the

properties of the cable and the durability of the connectors. ... The transistor came out and started being used in Cable TV equipment about 1958. That was a big gain."

Franchising was never a problem. There was no bidding, and the documents usually took no more than three pages. Bliss and Mitchell could set their own poles and do most anything using the streets and alleys. They leased poles from the telephone company and had to go through the usual process of clearing space on the poles. They had no difficulties with pole attachment agreements, until they got to Riverton, about 1958. Somewhere in the telephone company hierarchy the decision had been made, as Mitchell put it, "Don't rent any more space to cable people." He thinks it may have been the result of pressure from broadcasters. So in Riverton, they had to set their own poles.

THE CARTER MOUNTAIN SITE DEVELOPMENT

Each of the six systems was carrying only one channel, either Billings or Casper. Although the stations were beginning to operate for longer hours, the public still wanted more variety. "But we still had no national network feed," Mitchell said. "We couldn't get the World Series ball games." In 1953, Daniels and the Schneiders had leased microwave facilities from AT&T, at enormous expense, to relay one Denver signal into Casper, since no TV signals could be received at Casper without microwave relay.

Bliss said, "That was terrific. We wanted that so badly [for Western Television], but to try to get that microwave up into the Bighorn Basin from Casper was not feasible at that time. The cost of leasing microwave channels from AT&T was simply prohibitive. ... After we did Lander, we then got the idea that maybe if we got over to the west side of the Bighorn Basin we might be able to pick up KID-TV, Idaho Falls. We were looking for more channels."

Mitchell then said, "Again with an airplane, we did a lot of searching. We found a signal high on the top of Carter Mountain ... about twenty-five to thirty miles southwest of Cody, Wyoming. ... It was at 12,000 feet. It was up where there was snow the year round—well almost." It was about seventy-five miles west of Worland. "By that time, though, it had been determined that it would be legal to use microwave to transport Cable TV signals if you operated as a common carrier. Now, you couldn't own private microwave—as you can now—but you could have a common carrier microwave system. So, [about 1959 or 1960] we formed a common carrier company ... called Carter Mountain Transmission Corporation." Principals were Bliss and Mitchell, along with Brick Melbraeten and Harry Moore, owners of the Cable TV system at Cody. The television signals of KID-TV picked up at Carter Mountain would be relayed by common carrier microwave to the Cody system and the Western Television systems at Worland, Basin, and Greybull. In addition, they would relay the KID-TV signal to the television broadcasting

station in Billings. However, they could not get a clear path to Thermopolis, Lander, or Riverton.[3]

Mitchell said, "I think the top of Carter Mountain [12,000 feet] was the highest microwave relay spot anywhere in the world at that time. We used Raytheon equipment up there, and Raytheon used that in one of their ads for several years. The equipment worked remarkably well, considering the elevation and the hardships it had to go through up there. ... We took it up by truck. Most summers, you could only get [into the site] about a month. And during that one month we had to take up fuel and anything else heavy that was going to be taken in there. ... There was a little airstrip."

But Bliss said, "Not for my Bonanza, no way!"

And Mitchell agreed, "Not for anything but Super Cubs or helicopters. We'd use helicopters sometimes. It was a windy, terrible place. But it was the only place there was a signal from Idaho Falls. ... That was, maybe, one of the longest successful off-air pickups—at 175 miles—worth picking up. ... It was a good signal."

"He used a quad [four stacked Yagi antennas]," Bliss added. "[The signal] came right across a wilderness area—the southern part of Yellowstone. But there was nothing in between except bear and elk, you know."

"We had lightning problems," Mitchell recalled. "But I don't believe we had any outages due to lightning. I've been up there when it was storming. I was so scared I wanted to go somewhere, but there was no place to go!" For electrical power, they used a diesel generator with a large supply of diesel fuel. Mitchell said, "It was a wonderful engine. The cylinder was about eight or ten inches in diameter—a big old oil-field type diesel—working constantly at 625 rpm—with surprisingly little [breakdown] after we finally figured out how to keep it cool. ... I don't think it quit, in fact, for some thirty months. ... We would shut it down long enough to change the valve head once a year, then we would run on a little portable generator. The first year, we miscalculated and had to get fuel in on pack horses. We had a string of about thirty horses with ten gallons, in two five-gallon cans on each horse. ... Twenty-five hundred gallons wasn't enough for twenty-four hour operation for a year."

Then Bliss explained, "We had a thermal siphon system. We took everything off that could cause trouble—the radiator, the fan belts, things like that—and we had a thermal siphon system of about 100 gallons of Prestone-water mix. As the heat would go up, [the coolant] would go outside into this tank and come back in. But, we had a terrible time getting that started."

Mitchell said, "I think Roy figured that out."

"Well, we'd been talking to [a repairman]," Bliss replied, "and they had told us, you know, that it'll work that way. And we even had a barrel of oil—a whole barrel of oil—with a float arrangement just to keep the oil level constant. ... We did change [the oil] once a year. When we shut it down, we couldn't feel there was any wear after two years."

MICROWAVE SYSTEM FOR SALT LAKE CITY RELAY

"By this time," according to Mitchell, "Al Carollo had built systems in Rock Springs and Green River, Wyoming, and had put in a microwave system that brought Salt Lake City channels from Evanston into Rock Springs. We wanted to get those four channels from Salt Lake City into [our] towns. So, we engineered and devised a system that would pick up off of White Mountain at Rock Springs, then relay to South Pass, and repeat at South Pass into Copper Mountain [seventeen miles southeast of Thermopolis]. Then, from Copper Mountain, [it would] spread into Riverton, Lander, Thermopolis, Worland, Basin, and Greybull, and also over to Cedar Mountain [five miles southwest of Cody where it would feed] into Cody and Powell. Also, from [the split at] Copper Mountain, [it would relay] to Dome Mountain and into the town of Sheridan, which was in operation by that time [seventy-five miles northeast of Worland, near the Montana border]. It was an elaborate system and a lot of expense."

Bliss added, "$250,000 to $300,000."

Then, Mitchell said, "We [Carter Mountain Transmission Corp.] applied [to the FCC] for the [construction permits]. ... We had outside customers, and we had a five-channel system running all this distance. ... In the meantime, we were serving off-the-air KID-TV signals into the broadcast station in Billings. They [Bliss and Mitchell] already had KID-TV by microwave in Worland, Basin, and Greybull, as well as Cody, and they had Casper TV directly off-the-air, in Thermopolis, Lander, and Riverton]. ... Anyway, we applied for a permit for the Salt Lake City [relay] complex, and we got it.

"I can't remember exactly what year that was," Mitchell said. "Anyway, we had worked on it, of course, all that year, and we finally received the permits in August, I believe [1961]. We had ordered equipment, contingent on grant, and it was shipped immediately. It came within a few days. Because we were looking to winter weather, even though we weren't ready to put it in operation, we actually separated it out and immediately carried it up on the mountain sites to get it up there in case of bad weather."

Then it happened. They were notified in 1962, by a call from E. Stratford Smith, the attorney who had filed the applications for them, that the FCC had withdrawn the authorizations for common carrier service to the six Western Television cable systems.[4] Mitchell said, "So, we were caught with this order revoking the permit, with the sites all built, buildings up there, equipment in the buildings, but not on the air."

To reinstate the permits, Western Television had to agree to carry KWRB-TV Thermopolis on its systems and protect the station against program duplication for thirty days before and after the broadcast of any program by KWRB-TV. Bliss and Mitchell would not agree to the non-duplication condition, and the permits for Salt Lake City service to the six Western Television cable systems were revoked.

The amended conditions were in response to a petition by Mildred and Joe Ernst, who owned a radio station in Worland. Mitchell said, "Oh yeah! I knew them. In fact, I'd worked for them ... in the early years when they first came to the Worland area. I helped them build their radio stations. ... They had radio stations until they decided to build this little television station [KWRB-TV] up on top of Boysen Peak."

"Out of used GE equipment," Bliss added.

Mitchell continued, "The basis of the protest, of course, was economic injury. They said, 'If you let these cable people bring these television signals into *our town* [KWRB-TV would suffer serious economic injury].'... They actually considered that they were the off-air communications agents in that area! ... I don't believe they had actually gotten on the air when they filed the protest."

Bliss said, "I don't believe they were. ... See, their transmitter was on Boysen Peak [forty miles south of Worland and thirteen miles south of Thermopolis], but it was just on a telephone pole and it was [secondhand] General Electric equipment that they'd picked up somewhere."

"Nothing against that," Mitchell added, "but we did feel like that if anybody was first-comer, it would have had to be us."

Bliss continued, "Well, one other argument: They said, 'We serve all the ranchers, and the cable company can't do that.' "

Smith explained, "The transmitter was located on a 7,500-foot mountain peak, and the Ernsts claimed to have 50,000 to 60,000 viewers in the rural areas of northwestern Wyoming. ... Although the station was assigned to Thermopolis, about thirteen miles north of the site, the studio was reported to be located in the basement of the Ernsts' home in Worland, nearly forty miles to the north."[5]

"I mean," said Mitchell, "I had no animosity against them, really, but it just really threw a monkey wrench into the operation. It really put a halt to things. ... We were able to return [the equipment] to Raytheon—the equipment that we didn't use. ... Whatever that amounted to—I think it was $175,000 worth—we had to return it. ... We did use some of it, of course, because it was that backbone that was in operation. ... We put Salt Lake City into Cody and Sheridan." These towns were well beyond the service area claimed by the Ernsts.

The *must-carry* condition to reinstatement of the permits was not a problem. "Well, we were carrying her [Mildred Ernst's TV station] already so that was no problem," Mitchell said. "We'd been carrying her in all the systems, and as hard up as we were for signals, we would have carried anything we could get—good or bad. ... But I think the provision that we would never carry what she was carrying was a little bit too hard to swallow. ... Well, because she was cherry-picking—moving from network to network. And also, her signals were not that good. ... The *non-duplication*—having to take off a good signal that was coming in direct on microwave and carry instead a signal that had been through her transmitter and back out and picked up again—when it probably wouldn't have been nearly as good a signal, and especially not in color [was a serious problem for us]."

In his report after a hearing at the FCC, the examiner (now called an administrative law judge) found no evidence to support the Ernsts' argument. Smith, who was legal counsel for Carter Mountain Transmission Corporation, said, "At the Commission level, its Common Carrier Bureau agreed with us and argued to the Commission that it could not deny common carrier service because of the end use of the service unless that use were illegal."[6] Notwithstanding, the Commission overruled its examiner and added the conditions to the permits.

According to Bliss, "Strat couldn't believe that it was happening." In fact, Smith told Bliss, "This can't stand!" And Bliss said, "That was the impression that we got from him—surely, you know, there's some mistake here!" In his Oral History, Smith said, "[The] *Carter Mountain* [ruling] was thought to be vulnerable to reversal in the courts because it conditioned a grant on restricting or controlling the end use of the service, which I contended, and the FCC's Common Carrier Bureau agreed, was illegal. ... An analogy we used was that the FCC could not deny a member of the public access to telephone service because it did not like what that person planned to say on the telephone."[7] Smith and his law partner, Jack Cole, appealed the ruling to the Court of Appeals for the D.C. Circuit.

Bliss and Mitchell found themselves in a difficult position pending the outcome of the appeal. Service to Cody and Sheridan, through microwave repeaters at South Pass, Copper Mountain, Cedar Mountain, and Dome Mountain, was not affected, and Carter Mountain Transmission Corporation continued to meet its obligations. But they could not deliver the Salt Lake City signals to any of the six Western Television Cable TV systems.

It was bad enough that they could not provide subscribers with the national network programs, in color, from Salt Lake City. But, Mitchell said, "You see, also the translators had arrived," adding insult to injury.[8] "The translators were picking up approximately the same thing that we were picking up and distributing those signals into [Riverton and Lander]. This was long before satellites were ever in operation. So, we were there with cable systems carrying the same things for $5 a month that you could get off an antenna from the translators. Business wasn't too good!"

Penetration at that time was only 20 to 30 percent. Growth came to a standstill. "You know it's hard," said Bliss, "to knock on a door and try to sell them something when we really don't have anything more than they've already got. ... We were alive, but just barely. We had 2,500 subscribers in those six systems ... We were in debt—not bad, though. But we were treading water. That's what we were doing."

Mitchell added, "Well, we made it along there for two or three years." Moreover, legal counsel across the country kept telling them, "Well, this can't be. You can get out of this if you just hang around and wait long enough and work at it."

"With nothing much else to do and lots of fool ambition," said Mitchell, "we built a land line from the top of Copper Mountain to Thermopolis, with open wire! ... It so happened that the repeater site on Copper Mountain was twenty-six

[route] miles from the town of Thermopolis. ... That was an ungodly project—to build twenty-six miles of line to a town of [a few] thousand people. It had no power, so it had to be battery-operated open wire. That would have been impossible with [coaxial] cable, but it was possible with open wire. We only had a few amplifiers, three miles apart with the open wire. We used some of the very early transistorized equipment so we could power it with batteries. ... And it did work. ... Of course, it had a positive impact on sales in Thermopolis.

"There was a gray area there," Mitchell recalled, "of whether or not it was legal to take signals from a common carrier repeater station and landline to somewhere. But we got by with it. It was never formally questioned. We did finally ... put some Salt Lake City channels into the town of Thermopolis. ... We did that for lack of anything much else we could do. ... " They even experimented with a Raytheon scheme for carrying two pictures in one channel, trying to diplex a second channel on the Casper signal in Riverton. It did not work, because the two channels did not use common sync timing.

Finally, the Court of Appeals issued its long-awaited ruling in 1963. Roy Bliss, Tom Mitchell, Carter Mountain Transmission Corp., the cable industry, and its lawyers were dumfounded to find that the Court of Appeals had sided with the FCC. Smith said, "[The court held] that the Commission had overall responsibility for broadcasting and let [the ruling] stand. We petitioned the Supreme Court for a *writ of certiorari*, but were denied."[9] Thus the case was closed in 1963. Smith said later, in his Oral History, "*Carter Mountain* was a major milestone in the development of Cable TV regulation and a major millstone around the neck of the developing CATV industry."[10]

It has been suggested that former FCC Commissioner Kenneth A. Cox may have played a significant role in the astonishing 1962 FCC ruling in the *Carter Mountain* case. Cox was a young Seattle lawyer with connections to U.S. Senator Warren Magnuson, then chairman of the Senate Subcommittee on Communications. Cox was designated special counsel for the 1958 investigation by the Subcommittee on the Problems of Television Service for Smaller Communities, covering Cable TV and the "illegal booster." The subcommittee did not issue a committee report on the hearings. However, Cox personally wrote the staff report, known as the Cox Report.

Smith said, "Cox conceded that the broadcasters had not shown that Cable TV had forced any stations off the air. ... But he was of the view that unregulated Cable TV systems could drive stations off the air in small markets and was critical of the FCC for not asserting jurisdiction or asking for legislation to do so."[11] Moreover, as Smith recalled, "Mrs. Ernst appeared at the hearings in 1958 and presented a very appealing story about the family efforts to bring television service to the regions, and of the entry of Cable TV systems into the four towns they considered to be their service area."[12] The Cox Report was released on December 26, 1958. Literally within days, Kenneth Cox was named Chief of the Broadcast

Bureau at the FCC.[13] In March 1963, President John F. Kennedy appointed him to a full term as commissioner.

Now that the adverse ruling was final, Bliss said, "We knew we had to do something. So we got in my Bonanza, and we tried to raise money to buy KWRB-TV out. Our lawyer dickered with [Mildred Ernst] about this." Bliss and his attorney went to San Francisco, Denver, all over, trying to borrow enough to buy out the Ernsts. They talked to bankers who would say, "What is Cable TV?" According to Bliss, the banker would look at the operation and ask, "Why will you give her all this money to buy this [low-cost, secondhand] equipment?" Bliss answered, "All we wanted was to get her out of the picture. But they couldn't understand it. They thought we were buying a TV station." Mitchell recalled that it would take about $500,000. "But," he said, "it [couldn't be raised] on that kind of a deal."

For a couple more years, Bliss and Mitchell kept hoping for some kind of relief. Their plight had become well known in the industry. Bill Daniels helped them look for funds with which to buy out the TV station. Bob Magness, who was just beginning to put together the group of systems that soon became TeleCommunications Inc. (TCI), asked if they were ready to sell the systems. Finally, in 1965, with no relief in sight from the FCC ruling, they sold the systems at Worland, Thermopolis, Lander, and Riverton to Magness. The systems at Basin and Greybull were sold to Carl Williams, as an individual.

The interviewer asked, "What made the systems attractive to Magness? You were faced with the problems of not being able to bring in the signals [from Salt Lake City] by microwave."

Bliss said, "Well, you'd have to ask him. I think, with his Salt Lake City connections and the fact they were going to bring in the Salt Lake City [signals], he could see that there was going to be no problem, as far as they could see, of taking her out of the picture. ... See, they had the money."

Mitchell added, "And by that time, Magness and George Hatch, a broadcaster and newspaperman in Salt Lake City [*Salt Lake Tribune*, according to Bliss] were in a partnership arrangement and already had acquired some franchises, I think, in the Utah basin area. I suppose, if I had to guess, that they figured that they had some way to pursue the political route—or live with it until the political situation changed."

Then the interviewer asked, "What happened to KWRB-TV?"

And Mitchell said, "The Ernsts are deceased, but the station is still in operation."

POSTSCRIPT

Roy Bliss Sr. went back to Illinois in 1965 and started CATV systems first at Fairbury, about 100 miles downstate from Chicago, then at Chenoa, Forest, Chatsworth, and Gibson City. Tom Mitchell "went into freelance engineering, advisory, and construction." He formed a little construction company, installed some microwave systems, built some systems, "and helped a lot of systems get

over problems of one kind or another ... mostly in the West." He did a lot of work for Carl Williams and finally went full time as an employee for Televents. Mitchell helped Bliss obtain the franchise for the Fairbury system, and his construction firm helped build it. Bliss sold the Illinois package in 1980 and moved to Mesa, Arizona, where he and his family had often come in the winter.

Notes

1. *Roy Bliss, An Oral History*, interview by E. Stratford Smith, October 1991 (Denver: The Cable Center).
2. For a technical description of distributed gain amplifiers, see H.C. Rudenberg and Fitzroy Kennedy, "200-Mc Travelling Wave Chain Amplifier," *Electronics* 22, no. 12 (December 1949): pp. 106–109.
3. In 1953, the Federal Communications Commission awarded J.E. Belknap & Associates, of Poplar Bluff, Missouri, the first independent microwave common carrier construction permit for the purpose of relaying television broadcast programs to Cable TV systems, according to *E. Stratford Smith, An Oral History* (interview by Pat Parsons, March 1986 [Denver: The Cable Center]). Although the system was never constructed, the FCC subsequently granted other similar requests.
4. Ibid.
5. Ibid.
6. Ibid.
7. Ibid.
8. Translators are low-power television signal repeaters, picking up off-the-air broadcast TV signals and rebroadcasting them into communities in the valley where the signals could not be picked up directly.
9. Smith, op. cit.
10. Ibid.
11. Ibid.
12. Ibid.
13. Ibid.

CHAPTER 5

JOHN G. CAMPBELL

John Campbell started his first Cable TV system at Mineral Wells, Texas, in 1951. He sold the system to Bob Magness in 1962 and began manufacturing equipment for the Cable TV industry as CAS Manufacturing Inc. The company was merged into Channel Master (an Avnet affiliate) in 1969. Two years later, Campbell bought it back and went public as TOCOM. General Instruments (Jerrold) acquired TOCOM in 1984. The City of Austin awarded cable television franchises, in 1963, to Campbell, doing business as TV Cable of Austin, as well as to Capital Cable, a company in which then-Senator Lyndon B. Johnson was widely believed to have a significant interest. The story of the intrigue surrounding the resulting "cable race" and its outcome is told in Chapter 6. John Campbell's story is told largely from his Oral History, interviewed by Robert Dudley in May 1986.[1]

PERSONAL HISTORY

John Campbell was born December 28, 1926, in Grace City, North Dakota, which is on the James River, about forty-five miles north of Jamestown. His father, Alexander Campbell, came to North Dakota as a pioneer from Quebec, at the turn of the century. His first wife froze to death when they were caught in a blizzard. John's three half brothers were full grown when his father married John's mother, who was about twenty-five years younger than his father. John has two full brothers; Chester is the older one and Dave the younger. John's father and his three half brothers were in the dirt-moving and road construction business. John Campbell said, "My two full brothers followed that same line of work when they grew up. I'm the only one who wandered from the fold."

John Campbell's parents were Christian Scientists. In 1932, when John was about five years old, they read about a utopian colony being formed in Christiansted, Texas, some thirty miles southwest of Fort Worth on the Brazos River. The leader was a man named Christianson who had acquired 20,000 or more acres and tried to establish various industries in which members of the colony could work on a share-and-share-alike basis. Alexander Campbell bought land in the colony and built a small house where his family lived for five or six years. But the

whole idea collapsed and went bankrupt during the Depression. Unfortunately, Christianson had misled everyone about his title to the land, and the Campbells lost their home place. In 1939, they moved into a house Alexander Campbell had bought (for $700) in Granbury, Texas, a short way up the Brazos River. John graduated from high school in 1944. He and his younger brother Dave are still living in Granbury. Chester also lived in Granbury until 1974 when he died of Hodgkin's disease. Their parents are no longer living.

When John Campbell was a freshman in high school, he helped with the family living expenses by working in the local theater at the popcorn machine. Then, during his sophomore year, he began running the projectors, for two showings each night except Sunday. The projectionist at the time was Fred Wilkerson, a radio and electronics buff, who first introduced Campbell to electronics. While he was still in high school, Campbell joined the Army Air Corps Reserve. He went right out of high school to a specialized reserve program at the University of Arkansas, where a year's courses were crammed into a six-month period, with credit for a full year of college. While he was waiting to be transferred to active duty, the War ended. He joined the Navy, where he spent a year in the electronics branch and started home study courses, which he completed when he got out.

Campbell got a job as a projectionist in Clifton, Texas, about fifty miles down the Brazos River from Granbury. With his veteran's benefits, he went to Clifton Junior College and graduated in 1949. His ambition was to own a small theater. He saw the drive-in theater business grow and regretted that he had missed out on it. He also had a radio shop where he would work during the day and run the projector at night. He arranged to install TV antennas for dealers in Clifton where the deep-fringe reception was spotty at best.

GETTING STARTED IN CABLE TV

It was about the time he graduated from junior college that he saw an article in *Radio-TV News* about Bob Tarlton's community antenna television system (CATV) in Lansford, Pennsylvania.[2] "I just knew this was going to be my future," he said, "so I started looking around." Clifton did not seem big enough for a cable system. After looking at other areas around the state, Campbell decided Mineral Wells seemed about ideal for cable, with perhaps 3,000 to 4,000 households at that time. It is about forty-five miles west of Fort Worth and seventy-five miles west of Dallas. By 1949, three TV stations had begun operation on channels 4 and 8 in Dallas and Channel 5 in Fort Worth. People living west of the intervening hills had to put antennas on 100-foot towers to get a decent picture but could get a good picture up in the hills. The economy was a bit depressed because the air base had just closed. "But," as Campbell said, "other things took up the slack.

"I got a copy of a franchise from Bob Tarlton or someone else," he recalled. "I took it to an attorney in Mineral Wells and had him rewrite it to conform to Texas law. I applied for the franchise to the City Council." In those days, no one knew what community television was, and franchises were awarded almost on request.

The site Campbell had leased for his antenna tower was on the hilltop where the police and the power company had two-way radio facilities. The technician responsible for maintaining them protested the franchise because he was afraid that the radio facilities might interfere with television reception. One of the two city commissioners in Mineral Wells said, "Let's go ahead and give it to him. I don't think it's going to work anyway. What difference does it make?" Within a month to six weeks, the franchise was granted, and Campbell moved his family to Mineral Wells.

By this time he had married his high school sweetheart from Granbury and already had two sons, Ben and Johnny, born in Clifton. His daughter Becki and younger son Tom were born after they moved to Mineral Wells. Campbell said, "My son Ben grew up in the business and started building some cable systems. Then he started doing some franchising. He and I did a number of franchises up around Wichita Falls, Texas: Burkburnett, Vernon, Seymour, and Electra. ... This came about in the mid-1970s."

Campbell never saw a CATV system actually in operation. "There weren't any around, and I never did go east," he said. "Pennsylvania is a long way off." However, he called Tarlton after reading about his community antenna in Lansford, Pennsylvania. From that call, he learned there was a similar operation in Graham, Texas, thirty-five miles northwest of Mineral Wells. Campbell went to Graham to talk with Brown Walker, who was in the jukebox business. Walker had obtained the franchise for a community television system in Graham, which was about the same size as Mineral Wells, although the economy was a little better. However, it was far enough away from the Dallas-Fort Worth area that Walker was unable to get a usable signal, even on a 200-foot tower. There were no mountain ridges to provide "obstacle gain," such as might be experienced in the Rocky Mountains and the Cascades. Months later, Walker built a 440-foot tower and started his system with a "snowy" picture that Campbell thought was only slightly better than no picture at all.

Campbell then approached the telephone company for permission to attach his coaxial cables to telephone poles. Just after he got the franchise, about mid-1951, Campbell recalled, "The telephone company ... did a survey on the first four or five streets that we wanted to wire. ... They gave us a bid of $20,000 to clear about three miles of poles. This was completely out of the question. We didn't have that kind of money." The power company usually had separate poles, and their "make-ready" charges and bonding requirements turned out to be much more reasonable than the telephone company's. So Campbell elected to go on power poles first. He said that the power company surveyor once told him, "I'm sorry we have to charge you anything for the [use of the] poles. ... I think, in time, you will have created enough business for us, using electricity for television, that we will give you free poles." According to Campbell, "It wasn't until four or five years later, after they [the power company] had been burned, that they increased

the bonds and the liability insurance. ... The power company never was as hard to work with as the telephone company."

Campbell talked with Bill Crawford, a salesman and manager of the Firestone appliance store, about building a community television distribution network in Mineral Wells. He was a young man, about Campbell's age, "a real go-getter." Campbell said, "He was about the only one who thought it was the neatest idea that had come along. He came in with me as a partner because I couldn't find anybody else who was interested. The banks weren't interested. He was able and did provide a little bit of financing.

"Then we bogged down," said Campbell. That was when Don Mitchell came into the picture. His company, Mitchell Industries, primarily built two-way radio equipment for aircraft in Mineral Wells. Mitchell bought out Crawford's interest and provided another $15,000 financing, "which really didn't go very far," said Campbell. "That was a lot of money in those days, and it got us through the first 200 connections." The operation was then incorporated as Community Aerial System (CAS). Campbell explains the rather unusual name: "If you look back at that article [in *Radio-TV News*] you will note that they talked about a community *aerial,* not a community *antenna,* as it later became.

"After the first year of operation," Campbell said, "we weren't doing too well." Mitchell did not want to increase his investment. So Campbell said, "I'll tell you what I'll do. You've got [about] $16,000 invested. I'll just take over and give you a note and pay you out in two or three years, and give you 10 percent interest." Mitchell said, "I'll take it." Campbell's attorney, Tom Creighton, was aghast. He said, "John, you'll never make it." But Campbell said, "I knew we were growing; we were working, and we were getting customers. I never missed a payment, and I paid him off in two years.

"At twenty-three," Campbell said, "I was pretty naïve about business and banking." He talked to several bankers who said, "It sounds like a good idea, but you know it's a capital loan." That was more risk than most bankers could accept. Many of the early Cable TV systems were financed primarily by installation (or "hook-up") charges. Upon advice of an accountant retained by the NCTA, installation charges were treated like a utility company's contributions in aid of construction and not reported as ordinary income. "At that time," Campbell said, "it was the only source of financing we had."

Campbell explained how he got started. "We charged $95 installation. Some people charged $125, but $95 seemed to be a good number. I could do it a little cheaper in Mineral Wells, because my initial cost for the tower and antenna was much less. I just put up an antenna and I was in business. I had customers signed up quickly. The monthly service charge was $3. We just built it piecemeal, extending it one street at a time, hooking up people as we went. We'd wire one block, hook up five people, get the $95 each, and go buy some more cable. It's the only way I had. ... While the guys were working on the poles, I would go knock on the doors to talk to the people. I'd say we were wiring the area, and when it was ready we would

like to hook them up for cable. You know, we're talking the first 200 to 300 connections." Then, in order to stimulate growth, CAS started a "pay-out" plan that would collect $15 to $20 upfront and $7 a month to pay out the installation fee. By the time the federal tax court disallowed the "contribution-in-aid-of-construction" tax exemption, other sources of financing had become more accessible.

Campbell said, "We actually got into the television business and sold televisions. ... That came about because we had about three or four TV dealers in Mineral Wells. In that whole area, there were maybe twenty-five sets in the beginning in 1951. With about 2,000 potential home sales, to get 500 subscribers would have been a real trick at that time. So, I started working with the dealers. We put installations into the dealers' showrooms so they could demonstrate the television sets. For a while, it worked pretty well.

"But," he continued, "some of them wanted to make it on both ends, because you are talking about [costs] of $150 to $200 for an antenna. I found out that some of the dealers would just sell an antenna, because they could make money off an antenna, but they weren't making anything on the cable installation." Campbell told one dealer, "I can sell television sets at cost and still make money." In self defense as much as anything, he decided to get into it directly. "We got the RCA, Magnavox, and Admiral lines. The effort was quite profitable. We had no sales force, but in a three-year period—1955, 1956, and 1957—we sold more television sets than all the other dealers combined. ... As we got further into it, we got finance companies to handle the financing. They would allow us to put some of the installation charges into the TV set contract."

Campbell recalled, "I had never even thought about getting into the television [set] business, but, at the time, it was our lifeblood. Profits from the television [sales] made the whole thing work. The cable itself, without bank financing, wouldn't have made it." Later, and at other places, the dealers objected strenuously to such practice, and franchises often stipulated that cable operators must not engage in television set sales or service. But there was no such restriction in Mineral Wells.

Equipment for Cable TV

Campbell said, "I concentrated on the part of town behind the hills, where it was hard to get a good signal on a home antenna and which was the more affluent part of town." In 1951, the Dallas-Fort Worth TV stations were operating at low power, from relatively short towers. Moreover, channels 4 and 8, in downtown Dallas, were about seventy-five miles from Mineral Wells, while Channel 5, in downtown Fort Worth, was only forty-five miles away. They are now at full power, on 1,500-foot towers located midway between Dallas and Fort Worth. Campbell said, "I put up a 100-foot tower with stacked Yagis on each channel, and I received a good, reasonable signal from Dallas-Fort Worth. I put the tower on a city lot that I ended up buying for $100, or something like that. I built a small shack at the base of the tower [to accommodate the headend equipment]."

He said, "The first equipment I bought was some strip amplifiers by Taco-Plex. ... It was just a [separate] amplifier for each channel. Actually, I started carrying just two channels, 4 and 5. Later on, I was able to buy a converter to convert Channel 8 to Channel 2, so I could have three channels: 2, 4, and 5." Jerrold later bought the Taco company, primarily for the Yagi-type antenna arrays that it had been manufacturing since the end of the War. At one time, Taco's chief engineer came down to Mineral Wells to see what Campbell was doing. "We were running at that time through about four or five amplifiers," according to Campbell.

He said, "The headend amplifier fed the first houses or clusters of houses. We hooked up about eight houses within two blocks of the headend. The next thing was to install a repeater amplifier to expand down the street. We were able to repeat it the first time fairly easily and the second time reasonably without much problem. But then [we began to have] all the problems of temperature variations affecting the cable and picture quality."

According to Campbell, "Everyone (especially Jerrold) said you couldn't run adjacent channels [on a Cable TV system]. Some people, including Entron, said you could. Most of the TV sets didn't have an adjacent channel trap ... so the adjacent sound always affected the upper adjacent channel." Campbell's solution was to offset the channel frequencies by 1 MHz from their assigned values, to increase the channel separation and minimize adjacent channel interference in the TV set.

"Jerrold's approach to getting five channels was quite different," Campbell said. "Jerrold came out with their K-System. The first time I saw it was in Brady, Texas. At the headend, they would set up the individual channels—2, 3, 4, 5, and 6—in strips. Before they mixed them, they'd take channels 3 and 5 and convert them to a sub-band. They'd called it sub-3 and sub-5. Then out in the trunk, they would amplify the 2, 4, and 6 like they normally did in the three-channel system. They'd also amplify the sub-3 and sub-5 with strips. Then, at distribution points, they would convert the sub-3 and sub-5 back up to regular 3 and 5 and run it into the homes. It was a very expensive process.

"At that time [1952]," according to Campbell, "Blonder Tongue was building an apartment house system that was all-band. They amplified the low band [channels 2 to 6] and the high bands [channels 7 to 13] in basically the same amplifier, which had a lot of gimmicks and gadgets to do the tuning. These were used in some of the early systems, and I bought some of them. However," he added, "we had to realign them to make them work in a cable system."

In 1953, he attended his first NCTA convention, in New York. There, he saw the Entron distributed-gain, broadband amplifier, with twelve vacuum tubes, providing 22–24 dB gain for the low band (channels 2–6).[3] Campbell said, "I kind of took their lead, but instead of using twelve tubes, I used four. Mine was basically like a strip amplifier except we stagger-tuned it and broadened it out to cover the full low band. It went up to a sharp cutoff at 90 MHz.

"I don't think I'd have ever made it if it hadn't been for one piece of equipment—a Philco sweep generator model 7008, which was designed for television

repair work. It was a sweep generator with a little three-inch scope built into it with a marker. You could only look at one channel at a time because the sweep width was only 8 MHz. I learned [a lot with this] just by trial and error."

CAS Manufacturing Inc.

"From [all] those experiences, I learned that, instead of buying these strip amplifiers, I could build my own [broadband] amplifiers. We could get signals through the cable at lower levels than you would with the strip amplifiers ... and do it in broadband fashion, just the low band. So I combined all the ideas and came up with a little amplifier with only four tubes that would amplify the low band. This was during the second year of operation at Mineral Wells [1952].

"Once I built a little four-tube amplifier that worked so well," Campbell said, "that Brown Walker came down, saw what I was doing, and took one back. Brown said, 'Man, this is the greatest thing that I've ever had. It works. Let's build 100 of them. I'll put in some money.' Half went into Mineral Wells and half into Graham."

Campbell said, "The amplifier's success was in getting us over the hurdle of cascading the signal through ten or twelve amplifiers. I printed up a little brochure and mailed it to everybody in the cable industry and offered to send them one on a free trial basis. Pretty soon, I was selling them to a lot of people. We ended up having approximately $100,000 gross sales of amplifier equipment in the second year. We had no real competition. ... I sold the little amplifier for $85. I could build it for about $15 or $16. The parts were maybe $12. There was no jobber or anything; it was direct mail. No one had an amplifier like that. ... All of Jerrold's systems (I can't recall the exact years, but through 1955, I think) were the three-strip design." This little amplifier was marketed in 1952–1953 as the C2-6A.

John Threadgill was having a problem with the K-System installation at Brady, Texas. Campbell said, "We started replacing them with our little four-tube amplifiers, at $85 a lick. Those Jerrold installations were over $500 per station, and [today] it would cost at least $2,000 for that type of an amplifier. We took all the K-Systems out and just laid these little amplifiers in that big box and had better pictures. He eventually changed out the whole system."

While Don Mitchell was a participant in CAS, Campbell often visited the Mitchell Industries plant, where he observed the techniques for building electronic equipment. After he bought Mitchell out of the system, Campbell continued buying parts from him and building a few amplifiers. Then he started having sheet metal shops stamp out chassis and cabinets. Campbell said, "I learned a lot from [Mitchell] by visits to his plant. From the experience with him as a partner, I learned something about assembly of electronics. Actually, I hired a couple of girls who had worked for him and knew how to do the assembly."

It was about 1958 or 1959, however, that Campbell began to get serious about manufacturing for the industry. In 1962, he sold the Mineral Wells cable TV system to Bob Magness (TeleCommunications Inc.) and went into full-time manufacturing, under the name of CAS Manufacturing Inc. The manufacturing

operation remained in Mineral Wells until 1964, when it was moved to Irving, Texas, midway between Dallas and Forth Worth. Campbell said, "When I first moved to Irving, I located a five-acre site that I contracted to buy. I wasn't able to get the utility companies to give me service in a reasonable time frame, so I relocated a quarter mile away in an industrial park. I bought the five-acre tract anyway. ... That site is now the playing field of Texas Stadium."

At first, CAS's only product was the C2-6A broadband, vacuum-tube amplifier, and marketing was largely by mail order. Around 1951 or 1952, Campbell made a patent search for a pressure tap he had designed, comparable to the units built by Jerrold and Entron. But it was too expensive to build, and he did not pursue it. The "Milk Cow" in 1965 was a pressure tap device with four outputs at the bottom, suggestive of a cow's udder. In 1958, he began experimenting with transistor amplifiers, and by 1960 he was building solid-state (transistorized) modulators, demodulators, and other headend equipment. In 1966, CAS Manufacturing developed a solid-state headend channel control, comparable to the Jerrold Channel Commander and Ameco Channeleer.

SALE TO AVNET

In 1969, CAS Manufacturing was sold to the Channel Master division of Avnet, which established an R&D laboratory in Middletown, New York. Several months before the NCTA convention in 1970, Campbell recalled the head of the Channel Master division, Syl Hurlehy, saying, "We've got to figure a way to be big in cable television. We want to be prominent. We want to be a big company in the business. Why don't you sit down with your people and come up with a concept, stating where you think the industry is going and what is its future. We'll put the money into it to make it happen. I'll take it to the Avnet board and we'll get the approval."

Campbell's idea was to develop applications based on two-way communication on the cable television network. The basic technology for bi-directional transmission was well known but rarely deployed in Cable TV networks at that time. Campbell said, "We envisioned that pay television would be the first thing that would be viable in the home. ... The next viable [applications] might be home security and various other services: [utility meter reading, TV ratings, opinion polling, and subscriber response]." They developed a mock-up display for the 1970 NCTA convention in Chicago, followed with a technical paper at the 1971 convention in Washington, D.C., by Bill Osborn of CAS Manufacturing describing the TOCOM (TOtal COMmunications) system.

The architecture for the Total Communications concept developed by CAS Manufacturing was based on network polling protocols. A signal would be transmitted simultaneously from the headend to all terminals authorized (by paying the appropriate fee) to use the service. This downstream signal, with a unique user address and coded request for information, would be multiplexed with the TV channels and repeated until all users had been addressed. Typically, the

request for information would be in simple "yes or no" form, such as "Is the burglar alarm activated?" "Do you want to buy the designated movie?" "Are you watching the *Tonight Show*?" Or, it might ask for the binary code representing a utility meter reading. Each addressed user terminal responds, in sequence, using a binary code, typically "yes" or "no," transmitted upstream, back to the headend. Other papers presented at the 1971 convention also described systems based on polling protocols with different parameters. Marvin Roth of Scientific Atlanta described a proprietary system called Security Alert, and Richard Callais described the Subscriber Response System developed by Hughes Aircraft for TelePrompTer.

After applying for patents for the TOCOM system in 1970–1971, the patents were issued in 1976. Then Campbell learned that Pioneer was building the Qube system for Warner-Amex. He said, "We waited, bided our time, and when they got a franchise in Houston ... and were proposing an interactive system in Dallas, we filed suit on the patent infringement. We spent many dollars fighting that. After the franchising died down, we could see nothing but more money spent. ... We just couldn't afford the litigation, so we settled."

TOCOM Inc.

"While we were getting [the TOCOM display and technical paper] ready," Campbell said, "Avnet decided they weren't going to spend any more money. ... One day, they woke up and saw what was happening to the economy. They didn't want to be another failure like LTV [Ling Temco Vought]. Any division that wasn't already making money would be sold or shut down." In 1971, after nearly two years with Avnet, Campbell bought back CAS Manufacturing, by borrowing against six cable systems he had built in Texas, Louisiana, and Oklahoma. In June 1972, the company went public with its first initial public offering (IPO). Campbell said, "We had already developed the Total Communications concept [that we called] TOCOM. So [at the suggestion of the brokers], we named the company TOCOM Inc., mainly for the public image in the IPO." Proceeds were to be used, in part, to develop the Total Communications concept.

The concept of bi-directional communication was given a significant boost in the 1972 FCC Report and Order requiring that Cable TV systems in major television markets have the "technical capacity for non-voice return communications." Franchise applications in most cities proposed every imaginable kind of two-way service. Nonetheless, Campbell said, "We didn't have a single customer in the Cable TV industry for the system we had developed. It was a crude system, but it worked. It had interactive service installed for [remote home] security. We weren't using the pay-per-view aspect. Our customers came from the planned communities developed through Housing and Urban Development (HUD) grants under the New Cities Act of 1970. There were thirteen planned communities approved by HUD ... and we had practically every one of them signed up for a TOCOM system."

The pay-per-view application was apparently ahead of its time. Campbell said, "The first [TOCOM] converter boxes had interactive components. They were capable of doing pay-per-view but also of doing security where [the information] was interfaced back through the cable to report [the status of] alarm systems from a panel in the home. ... From that evolved a home security box ... that reported security alarms over the cable. ... In the franchising activities in the late 1970s, practically every one of the applicants specified the TOCOM system. We sold some sixty- or seventy-odd computers to be installed in those systems, but very few were ever activated. Once they got the franchise, the emphasis was on getting subscribers. Many of them did not fulfill their obligations on the security system."

While the fierce franchise competition was under way, Paul Kagan, renowned for his newsletters and seminars on telecommunications, even launched a monthly newsletter dedicated to information regarding Cable TV security systems. In addition to the planned communities, TOCOM systems were installed in the Dayton, Ohio, franchise and the Park Cities in Dallas, where TOCOM set up separate companies to provide the security service as partners with the franchise holder.

TOCOM also worked with the *Wall Street Journal* to develop an interactive service for people with home computers. Campbell recalled, "That experience led us to the concept of the 55 PLUS™ system. It was a baseband receiver which converted the TV channels down to baseband video and audio, and then back to channels 3 or 4. While it was at baseband, you could substitute any other type of information. ...We built a character generator that would generate [messages] that could be superimposed on the picture or replace the screen. ... That's what everybody started bidding. Cox integrated it with their system. They were developing their own system but used our prototypes to demonstrate the system. A number of franchises were awarded with the 55 PLUS system. ... None of the real 55 PLUS was ever utilized once they got the franchise."

TRADE ASSOCIATION ACTIVITY

It was probably in the mid-1950s that Wholesale Electronics, of Dallas, invited several identifiable Cable TV franchise holders to a luncheon in Dallas to get acquainted. Campbell said, "Wholesale Electronics could see cable as a future possibility, because they were Taco dealers and had lines of wire. They were trying to develop some business. Nothing ever developed from it, but it was the first cable group to meet in Texas that I know of." In 1961, Campbell agreed to host the first meeting of the Texas Cable Television Association in Mineral Wells, at the old Baker Hotel. Campbell said, "Maybe seventy-five to a hundred people [attended], who were either getting into the business or were already in it. ... The people involved [in an earlier organizational meeting] were Ben Conroy, who had started the system at Uvalde; Jack Crosby from Del Rio; Jack Threadgill from Brady;

Johnny Mankin, who was general manager of Tyler. I don't think Brown Walker came to that meeting."

Campbell served for two years as the associates' director on the NCTA Board of Directors, representing the manufacturers and equipment suppliers to the industry. In 1972, he was inducted into the Cable TV Pioneers club, and, in 1976, he received the John Mankin Award of the Texas Cable Television Association for contributions to the industry.

Notes

1. *John G. Campbell, An Oral History*, interview by Bob Dudley, May 1986 (Denver: The Cable Center).
2. *Radio-TV News* (March 1951).
3. For technical description of distributed gain amplifiers, see H.C. Rudenberg and Fitzroy Kennedy, "200-Mc Travelling Wave Chain Amplifier," *Electronics* 22, no. 12 (December 1949): pp. 106–109.

CHAPTER 6

THE AUSTIN FRANCHISE

The cable television franchise in Austin, Texas, in 1964 and 1965, is a David and Goliath story. Incredibly, franchises were awarded to both John Campbell of Mineral Wells, Texas, and the Texas Broadcasting Company, owned principally by the Lyndon B. Johnson family. The political intrigue and raw covert power engulfing Campbell's vigorous progress in building the cable plant made news across the country. But when his lenders mysteriously withdrew, Campbell surrendered, while acknowledging that, in the end, the venture was financially successful for him. The story of the Austin franchise is told, in part, from John Campbell's Oral History interview by Robert Dudley in May 1986, and from newspaper reports in the Washington Evening Star and the Washington Post.[1]

TELEVISION IN AUSTIN, TEXAS

In the early 1950s, when John Campbell was building his system in Mineral Wells, he said, "A Cable TV franchise in Austin, Texas, was considered to be one of the most desirable franchises in the country—or *the* most desirable. There were 52,000 ... [households], one TV station, and it was at least eighty-five miles to the next two closest stations [at San Antonio]." The FCC had allotted only one of the highly desirable VHF television channels to Austin, the hometown of the powerful then-Senator Lyndon B. Johnson, who would soon become the majority leader in the Senate. In April 1952, the LBJ Company, owned principally by the Johnson family, began television broadcasting operations in Austin as KTBC-TV on Channel 7, with the likelihood of continuing for many years without effective competition for viewers. The station was a "cherry picker," selecting programs for broadcast from each of the three national networks. As Campbell said, "You had to put up a seventy-five to eighty-foot tower to get anything out of San Antonio, and then it was a just barely usable picture."

By 1957, people like Charlie Sammons and George Morrell (Midwest Video) had already applied for a community antenna television (CATV) franchise in Austin. "To protect the market," according to Campbell, "the LBJ Company ... also applied for a franchise. Midwest Video and LBJ Company signed an agreement to merge their efforts. Midwest Video, as Capital Cable (the merged company), would

continue to proceed in obtaining the franchise, with the LBJ Company having an option to buy half interest at such time as the system came into existence."

After the initial flurry of activity, the Austin City Council took no action on any of the franchise applications. Campbell said, "I'm sure that was politically motivated because the Johnson family owned the only VHF station in Austin. For five years [Cable TV] sat in that dormant state while cable franchises were being granted in much less desirable towns across the country." Then, late in 1962, the local newspaper filed an application for the franchise. The door was opened, and lots of applications came in to the council. Not surprisingly, Capital Cable revived its interest. "This is strictly my opinion," said Campbell, "but [by this time] Mr. Johnson had become vice president [of the U.S.] and no longer had the power that he had as [majority leader of the U.S. Senate]. New management in the family-owned newspaper decided to take on LBJ. It was the first time he had been bucked in that area in a long time, even with radio stations. It opened up for a lot of other applicants, and I just monitored the action."

Tom Creighton, the Mineral Wells attorney who had helped Campbell with the franchise there, was now a state senator. Through one of the law firms in Austin, Campbell and Creighton kept close watch on the proceedings. "It's unbelievable the way this thing worked out," Campbell said, "just unbelievable. This is the latter part of 1963. The franchise fight had gone on all summer long. ... Under all kinds of pressure and objections, [on January 28, 1963[2]] the council granted Capital Cable the franchise!" Then, as Campbell said, speaking in the vernacular, "The [expletive] hit the fan! The newspaper jumped all over them. First it was the local paper, and then it was picked up all over the country." Under great pressure from all sides, the council finally said, according to Campbell, "Yes, if somebody else wants a franchise, we'll grant one and you can compete." It was widely presumed that Capital Cable already had a pole lease agreement with the telephone company. Actually, according to Campbell, "It wasn't signed, but they said they had a contract." So, the newspaper informed the City Council, "We won't take a franchise because if they [Capital Cable] have got the contract with the telephone company, we can't compete."

So, Campbell saw the window of opportunity. He had opened up important contacts through the Austin law firm, which, as he said, "was very close to the city attorney at that time." With guidance from the law firm, he prepared a one-page letter applying for the franchise on behalf of his newly formed organization, TV Cable of Austin. He said, "[We] went to the council meeting, and nobody knew me except the city attorney. The meeting opened with a statement by a Mr. Brown, representing the telephone company. Mr. Brown said, 'We have reconsidered and we will do just the same as the city. We will grant a contract [for pole attachments] to anybody that has a franchise.' " John Campbell then submitted his letter. "I didn't even read it [to the council]," he said. "The city attorney read it, and the council voted me a franchise. They didn't even know who I was! The letter gave my background, in that I had CAS Manufacturing, and had been in the business ten to

twelve years [see Chapter 5]. ... Two days later, at a special meeting, the franchise was officially awarded. I signed a contract with the telephone company in two days, and then—*it was off to the races!*" It was TV Cable of Austin versus Capital Cable—John Campbell versus LBJ and George Morrell!

Campbell said, "I thought they [Capital Cable] were going to move slowly, and I could move fast. I came up with the idea of using intracity microwave. I was involved in the West Texas Microwave that came through Mineral Wells, so I was pretty well versed in microwave." Campbell reasoned that if Capital Cable were going to receive San Antonio signals on the 1,000-foot Channel 7 tower to wire Austin, it would come across from the northwest and not start at South Austin. "So," Campbell decided, "I can start with a cable system in South Austin.

"I was pretty young at the time, thirty-five years old, and I could move fast. I had cable on the ground in a week, and I was on the poles as soon as they let me. Within two weeks, we were stringing wire. I signed an agreement with Collins [Radio Company] to deliver the five channels of microwave. We picked up three signals at San Marcos [about fifty miles northeast of San Antonio], relayed them into South Austin, inserted the educational and the local signals, and microwaved out to four hubs." Within a year, TV Cable of Austin had 300 miles of cable plant and over 3,000 subscribers.

As Campbell began laying out the plant in South Austin, he often went into the city, looking for suitable maps, where he met and became friends with Herb Jackson, the head draftsman and design engineer for the City of Austin. Jackson had drawn every map and knew every pole and location in Austin. Campbell hired him part-time, and, with his help, the system design went very quickly. But Campbell also benefited from an inside track at Jerrold, which was designing the system for Capital Cable. Campbell said, "Well, I knew which areas they [Capital Cable] were interested in ... and I would apply for those poles. I had the poles all tied up, and Capital Cable couldn't get on them. I knew that there wasn't room for two cable systems on most of the poles, probably wouldn't be enough room for one without extensive work. This was one reason why I thought I had the battle on pole rights won. ... It's not whether you have a contract, but if you occupy the space. In some cases, we put up strand and miles of cable to capture the pole space."

Campbell said, "I thought for a while that they were not going to build. But all of a sudden they started building, and later on I found out [why]. They forced the City Council to hold a special meeting [to declare that] if one cable company was on the poles, they could build a horizontal bracket to [support] the second cable. ... Very few of the brackets were ever used. That was their way to get access to the poles."

Jack Cole, formerly a partner of attorney E. Stratford Smith, now had his own law firm and worked with Campbell on his microwave applications for the Austin system. Processing of the applications by the FCC had apparently been completed without delay, but the FCC would not issue the permits. Finally, as the

date for a critical progress report approached, Campbell went to the City Council to explain. "I told them that for some reason the FCC wouldn't grant the [permits], and I felt it was undue political pressure." Jimmy Banks, a reporter for the *Dallas Morning News* was there at the time. After talking with Campbell about the matter, he wrote an article that appeared in his paper and was picked up all over the country. According to Campbell, "In just a few days, we had the permits." Actually, they were received on July 10, 1963.[3] In order to get the microwave permits, TV Cable of Austin had to agree to carry the local station—no problem there—and not to duplicate any programming scheduled to be broadcast by the local station within thirty days before or after—the so-called "blackout rule." This was the *Carter Mountain* ruling that so effectively dashed Roy Bliss' elaborate plans in northwestern Wyoming (see Chapter 4). Campbell had requested waiver of the non-duplication rule, but it was denied. He was not greatly concerned and agreed to abide by the conditions, believing that his competitor would do the same.

For practical reasons, the "blackout" of programs from San Antonio to protect Channel 7's schedule was carried out by TV Cable of Austin with automatically timed switches. But, although all programs were available to subscribers, the switching was annoying, especially when the programs were not scheduled at the same time on both stations. It was also a nuisance for the system operator, since it was necessary to set up the program clock manually each day, in accordance with the complex schedules provided by Channel 7.

Capital Cable had obtained permission from LBJ Company to install its receiving antennas on the KTBC-TV 1,280-foot TV transmission tower, for a fee of $1,000 a month. Applications were filed with the FCC for microwave permits to relay signals from the top of the TV tower to distribution centers in Austin. Capital Cable also petitioned for waiver of the program non-duplication rule, as a condition for microwave permits. Its petition was also denied. Then, Capital Cable decided to use landlines instead of microwave, in order to avoid FCC jurisdiction and the "blackout rule." In this respect, Capital Cable had an advantage over TV Cable of Austin. In effect, it would have a thirty-day monopoly on all network programs. Capital Cable advertised that it alone could bring to its customers all programs without delay. "We know that TV watchers get real unhappy when their favorite TV program gets blacked out or delayed," the ads said.[4]

However, by using microwave instead of landlines to distribution points within the city of Austin, Campbell was able to connect customers at a much faster rate. By fall of 1963, according to the *Washington Evening Star*, Campbell already had 2,200 customers and was expecting soon to reach the "break-even" point with 4,500 customers, while Capital Cable reported that, since it began in December, it had gathered only about 700 customers.[5]

Nevertheless, Campbell felt that since his system was based on microwave, his business would be doomed unless the restrictions were removed. Therefore, in September 1963, Campbell's Washington attorney, Jack Cole, again petitioned the FCC for waiver of the non-duplication rule. The appeal was supported, in part, by

the argument that, "The local station [KTBC-TV] could not openly aid a CATV system in which it had an interest and at the same time expect the FCC to restrict a competitor."[6] In a telegram to the Commission, Midwest Video Corporation of Arkansas, parent firm of Capital Cable, warned that it would be compelled to "enlist the aid of our delegation in Congress ... if the FCC exempted TV Cable of Austin from the non-duplication rule." Among the influential Arkansas personalities (not mentioned in the telegram) were Oren Harris, chairman of the House Commerce Committee; and C. Hamilton Moses, attorney for Midwest Video, former president of Arkansas Power and Light, and now partner in the law firm in which Sen. John McClellan was once active.[7]

The following excerpts from a lengthy report by John Barron in the April 10, 1964, edition of the *Washington Evening Star* detailed the bizarre circumstances in which Campbell's appeal to the FCC for waiver of the non-duplication rule became enmeshed:[8]

> *The Commission had intended to rule on November 20. But in the late afternoon of November 22, President Kennedy and Vice President Johnson were to land in Austin on their Texas tour.*
>
> *The feeling was that if the FCC made public its verdict when planned, embarrassing headlines might await Mr. Johnson when he arrived in Austin.*
>
> *At 9:50 PM November 19, James Sheridan of the FCC Broadcast Bureau placed an unusual night call to Mr. Cole, Mr. Campbell's lawyer. He stated, according to Mr. Cole, that the Commission wanted to delay its ruling one week.*
>
> *Mr. Cole consented, with the mutual understanding that the ruling would be forthcoming November 27.*
>
> *Three days later, President Kennedy was murdered and Mr. Johnson became President. And on November 27, The FCC did not make the promised decision.*
>
> *At 3:15 PM that day, Mr. Sheridan again telephoned Mr. Cole. He said, according to Mr. Cole, the Commission had instructed him to report that it would require another week's time "in view of recent circumstances ..."*
>
> *But that deadline also passed.*
>
> *In December, the FCC again asked the Johnson station what it thought should be done "in the public interest."*
>
> *This time, Mr. Kellem [manager of LBJ Company and KTBC-TV] commented:*
>
> *"The situation in Austin Tex., is the same as in other cities where CATV systems operate, and Station KTBC-TV seeks the same protection afforded to all other television stations similarly situated."*
>
> *He emphasized that KTBC had not exercised its option to buy half of Capital Cable, had no "present" intention of doing so and thus had no "contractual way" of influencing Capital Cable.*
>
> *Having considered these views, the FCC on December 13 ruled against Mr. Campbell.*

The article in the *Washington Evening Star* then goes on to say:

> *Mr. Campbell in January asked the FCC to reconsider, declaring that "the public interest is seriously perverted in the present artificially contrived climate" maintained by the Government in Austin.*

And finally:

> *The FCC, which acknowledges that "you can't close your eyes to the fact that the President is in some way involved," has not indicated when its ruling on the Campbell appeal may be expected.*

Ultimately, the waiver was denied.

Bob Gibbins, who was a very good friend of Campbell and a member of the Texas State Legislature, was working for Capital Cable when Campbell was awarded a franchise in Austin. George Morrell, president of Capital Cable, immediately sent Gibbins to arrange a meeting. Campbell said, "The very night I got the franchise, I sat down in a meeting with George Morrell. He offered me a lot of different things that we could do together. I guess I wasn't as smart as I should have been. Maybe at that time I should have made some kind of deal. But I didn't. I was personally bitter towards the local situation."

To finance his venture in Austin, Campbell had applied for a $300,000 loan from a small business investment corporation (SBIC) in Galveston. He said, "We had been told it had been approved, and closing was just a formality. Then the SBIC board met formally and turned down the request. The guy who was handling it was dumbfounded, but he told us there was pressure from somewhere." Arrangements had already been made through the Houston SBIC office for Royal Street Investment in New Orleans to participate with the Galveston people in the loan. When it was turned down in Galveston, Royal Street Investment said, according to Campbell, "We are not going to be intimidated by the vice president." (This was in 1963, before the assassination of John F. Kennedy.) So they put together another group and made the loan. He said, "I think they had a warrant to buy 25 percent of the stock in TV Cable of Austin Inc."

"You could build a lot of cable system then, compared to what you could do for that kind of money today," Campbell said. But he himself had already financed the purchase of a lot of cable, Ameco amplifiers, and Collins microwave equipment. "So," he said, "with all the credit, plus the new investment, we were able to build a lot of system."

But early in 1964, Capital Cable made direct contact with Campbell seeking some way to put an end to the competition. Campbell said, "Lyndon Johnson has been president now for several months. They are looking toward the election in November." Moreover, Campbell was beginning to run out of funds again. So, Campbell, his attorney Tom Creighton, and Robert Humphreys, representing Royal Street Investment, went to Little Rock, Arkansas. They met with Morrell and his principals, including his attorney Hamilton Moses, and attorneys for Lyndon

Johnson. According to Campbell, "Mr. Moses, a very congenial gentleman, told us he was ready to retire. But he told us how he'd put together Arkansas Power and Light. It had been through mergers such as this. This was a situation of two companies, whether power company, telephone company, or cable, and it just wasn't good business to compete in the same market." Campbell said that Moses' position was, "We've got to put a stop to the competitive situation and work together." So Campbell said to him, "If that's your position—there shouldn't be two cable systems built in the same town—why did you do a competitive overbuild after I had already had our system basically built in a large part of Austin?"

Campbell then reported that Moses said, "Well, they (pointing to one of LBJ's attorneys) told me that if we would put pressure and go ahead and build a system, they could cut off your financing anywhere you went. They didn't hold up their end of the bargain. You got your financing, and you built the cable system, and now we've got to resolve it." Campbell went on to say, "We sat down that night with [Morrell's] board of directors who came in for a meeting of the Midwest Video group. We met all of the principals involved. Mr. Moses assured us, on the side, that we had a deal. We had agreed to a dollar figure of what they would pay for our system. Our banker from New Orleans [Royal Street Investment] had told us, 'We want to make a deal. We want out.' ... Mr. Moses said that he would talk to his board that evening, and in the morning we will have a deal."

So, they met for breakfast, and when everybody was seated, according to Campbell, Moses said, "Here's what the deal is." And it was exactly half of what he had said the previous evening it would be. Campbell said, "I looked at Creighton and Humphreys, and someone said, 'Let's go talk.' We had already checked out of the hotel. We didn't have much to say. This was the worst, rawest deal we've ever seen. He just set us up that night and then came back and offered us half. We picked up our bags, called a cab, and went to the airport. We didn't even go back to the meeting."

Three or four days later, Morrell called Creighton and said, "Tom, where did you go?" And Creighton replied, "You embarrassed us. It was just ridiculous." Morrell urged them to come back and meet again. Campbell did not go to the next meeting. He said, "Tom called me several times during the meeting. Finally there's a deal. Royal Street said, 'We are going to make the deal.' "

According to Campbell, "It was a good deal. I thought the real values of a cable system were not well established at that time, but we signed. .... [Royal Street] wanted out. They wouldn't participate any further in making more loans. They wanted to take their profit and get out. The SBIC is regulated through the Small Business Administration. They had pressure. They told us as much." In the end, however, Campbell acknowledged that the Austin venture was financially successful for him.

NOTES

1. *John G. Campbell, An Oral History,* interview by Bob Dudley, May 1986 (Denver: The Cable Center); *Washington Evening Star*, April 10, 1964; and *Washington Post*, January 11, 1964.
2. *Washington Evening Star*, op. cit.
3. Ibid.
4. Ibid.
5. Ibid.
6. Ibid.
7. *Washington Post*, op. cit.
8. *Washington Evening Star*, op. cit.

CHAPTER 7

CHARLES E. CLEMENTS

"Charlie" Clements is one of the few professional engineers among the early pioneers who first began to wire the small towns of rural America for community television reception. He lived in Waterville, a tiny village of a thousand souls, where he built the first Cable TV system in the state of Washington. Clements served as an engineering and management consultant to virtually all of the major multiple system operators in the industry. He became senior vice president for Homer Bergren's TeleVue systems in Oregon and Washington; and later vice president of engineering for Charles Dolan's TeleGuide closed-circuit system in the borough of Manhattan, New York City; and, finally, director of corporate development for TCI. Although Clements was not an equipment manufacturer, he was responsible for introducing important technological developments, many of which still represent fundamental engineering equipment and system design concepts. Charlie Clements died January 14, 2003. His story is told largely from his Oral History interview by David Mercer in August 1988.[1]

PERSONAL HISTORY

Charlie Clements was born and raised in Cashmere, Washington, about fifteen miles up the Wenatchee River northwest of the city of Wenatchee. His father was born in Illinois, in a log cabin near where Abraham Lincoln began his political career, but moved to Washington state in 1911–1912. There he met Charlie's mother, who had come to Wenatchee from Kentucky in 1908. Clements graduated from Cashmere High School in 1940 and spent two years at the University of California at Los Angeles studying space and aeronautical engineering.

In 1942, he married Peggy Wallace, a high school classmate. With the War in progress, he joined the Navy V-5 program and earned his BSEE at the University of Houston. In the Navy, he was sent to Corpus Christi, Texas, and then to the Pacific Fleet. He was discharged in December 1945, as a chief electronics technician. Clements said, "I never did take the officer candidate program, because I would have lost too much money. I wasn't going to make [the] Navy my career, so I just stayed as a chief petty officer." Mostly, he was involved in maintenance and

operation of equipment, and did lots of flying in the Northern Pacific on the Aleutian Chain Patrol in PBYs.

THE CLEMENTS RADIO AND TV COMPANY

In January 1946, Clements moved to Waterville, Washington. Rural electrification was just getting started, and many homes had no electricity. In anticipation of the potential market, Clements went into business with a friend who was opening an electrical appliance business. After a couple of years, they sold the business to Roy Anderson from Montana, and Clements took a job managing a tavern in Waterville. "During the time I ran the tavern," he recalled, "I was messing around with television, and I did some radio repair work on the side. I kept the radio repair business all the time."

Clements quickly became part of a group of close friends with common interests in radio and television in the Wenatchee Valley and northwestern Washington. At that time, George St. Peter was a sales representative for Seattle Radio Supply, from which Clements bought electronic supplies. Later on, St. Peter left Seattle Radio Supply and established his own Mid-State Radio in Wenatchee, with Rogan Jones and Jim Wallace as partners. Jones owned radio broadcasting station KVOS in Bellingham, and Wallace owned KPQ in Wenatchee. George Frese was chief engineer for both KPQ and KVOS. He was (and still is) a consulting radio and television broadcasting engineer in Wenatchee.

Clements said, "Channel 5, Seattle, was the only television station north of San Francisco and, I guess, west of Chicago. It was called KRSC-TV at that time, now KING-TV." Jones talked with Frese about trying to receive television programs in Bellingham from Seattle, a distance of about eighty miles. This was 1949, and, Clements recalled, "There were no commercially available Yagi antennas to check, so we were trying to receive signals by our own design. What we tried to do [Frese, St. Peter, and Clements] was to develop an antenna. ... The co-linear antenna we were working on was for the Bellingham thing. The signal was actually run down to a tavern from KVOS, and that was in 1949. I found out later that it was right after Ed Parsons had used an antenna to get signals from Channel 5, Seattle, into Astoria, Oregon. He had an open wire system. He just took some open wire down to several homes. ... Open wire is a pair of bare copper wires that are four or five inches apart. ... That's what Ed Parsons used. That's what we used in Bellingham initially." Like Parsons, however, they soon changed to coaxial cable.

Clements said, "We tried a co-linear array, and George Frese found a little signal on the Columbia River near East Wenatchee where he lived." The distance was close to 100 miles, with the mile-high Cascade Mountains in between. George St. Peter rushed enthusiastically up to Waterville and said, "We're getting a bounce off Mount Rainier." With that encouragement, Clements said, "We put an antenna on my house here [in Waterville] and got just a very faint signal. ... At that point [1950] we got some commercially available Yagi antennas. ... So we went up

to the edge of town, put up the antenna, and—by golly!—we got voice and just a little picture on a television set. Of course, we became very excited. I wondered: how can I get this signal down to these houses? This was on land belonging to one of the citizens in town who was very interested in television."

Clements needed to find some coaxial cable for the community antenna service he was trying to start in Waterville. At first, the only thing he could find, with 75-ohm characteristic impedance, was some military RG-6/U. Then he found some 90-ohm coaxial cable made in Great Britain, available in quantity at the Army surplus store in Fort Lewis. Clements said, "I think the first RG-11/U [military coaxial cable] available in any quantity was probably in 1951 or 1952. When that became available, I strung some RG-11/U. I connected my first customer in November 1950 ... a fellow named Paris Wainscott. We connected three or four of Paris' neighbors' houses. But I had so much cable loss that I couldn't get [the signal] down [to them].

"So how could we overcome this cable loss?" he asked. "I didn't know anybody who made any amplifiers. Later, I found out that a fellow named Milton Shapp [at Jerrold Electronics Corporation] was building some amplifiers in his garage in Pennsylvania to pass low-band television frequencies—one channel—to an apartment house complex in Atlantic City, New Jersey. I contacted Shapp. At that time, I think there were three people working there." But they were so busy with this project that Shapp said to Clements, "You're an engineer, why don't you build your own?" So, the first amplifiers that Clements used he built himself. "It only passed one channel," he said, "but that is all I needed." At that time, KRSC-TV, Seattle, was the only potentially receivable signal in the Pacific Northwest region. This was during the freeze imposed on new television permits by the FCC in 1948, while the staff examined critical issues of spectrum for television and technical assignment policies needed to minimize interference.

Subsequently, Jerrold became a major supplier to Cable TV. In 1953, Clements recalled, "Jim Wallace and Rogan Jones ... built a Cable TV system [in Wenatchee], and they were relying on Jerrold to supply the electronics and cable. ... Jerrold started overbuilding KPQ in Wenatchee. That was my first conflict with Shapp. Jim Wallace eventually sued Jerrold and got treble damages."

Then, Clements found there were other manufacturers making amplifiers to overcome losses in coaxial cable. He said, "RCA had made some strips, single-channel amplifiers. There was a company called Amplivision that was owned by Paramount. They were starting a cable television system in Palm Springs, California. I got acquainted with their chief engineer, Frank Vials, and we bought some Amplivision amplifiers for the Waterville system..."

For several years, Clements attached his television cables to poles belonging to the City of Waterville. Then one day he decided, "We're going to have to get an agreement, an ordinance. I had heard [about] this at one of our trade meetings." So he went to the City Council and got an ordinance. He said, "I think it was for twenty-five years. They were going to give me the pole use free, but I said, 'No, that's not right.' They were happy to have cable television. We agreed, I think, on

50 cents per year per pole." According to Clements, "All an ordinance does, really, is it allows you to use the same rights-of-way in the city that they grant to telephone companies and other utilities." The Waterville ordinance was similar to many others developed in those early days.

Without the Clements Radio and TV Company, no one in Waterville had television service, although the quality of the signal he provided was not always consistent and sometimes varied with weather conditions. According to Clements, "The first year, I'd say we probably had 150 [homes connected], and by 1955 we had 300—most all of the homes. ... I left the tavern in 1951 and started full-time with cable. ... As far as I know, [my] Waterville system was the first cable television system in Washington. ... Ed Parsons had Astoria, Oregon, before mine."

Additional channels were carried on the cable as new TV stations came into operation in Seattle and Spokane. A particularly vexing problem developed when Channel 4, Spokane, was added. Clements said, "At certain times of the year, particularly in early summer and fall ... the Channel 4 signal of WCCO, Minneapolis, or KTIV, Sioux City, would completely wipe out our Channel 4 from Spokane." This is due to a phenomenon called "skip." Television signals tend to bounce off the ionosphere E-layer located approximately seventy miles above the earth's surface, the "Heaviside layer," named after the British physicist Orville Heaviside. The reflected signals can be quite strong at long distances but actually pass over, or "skip," locations in between.

Clements said, "In Waterville, in 1954, I put my antenna site up on Badger Mountain, where I could get better television signals from Spokane, which is 115 miles to the east. I had open wire line coming down into town because of the [coaxial] cable losses and the cost." Open wire line consists of a pair of parallel bare wires spaced a few inches apart with insulating bars every foot or so along the length of the wires. Signal losses are considerably less than with coaxial cable, and the cost is low. As Clements pointed out, "The bad thing about open wire line is that at this latitude [near the Canadian border], in the wintertime you would have to go out and beat it with sticks to knock the ice off—especially at Rose Bowl [football game] time. I eventually replaced the open wire with G Line [described later in this chapter]. As soon as it became economically feasible, [the G Line was replaced] with buried 0.750-inch coaxial cable. That's the way it is now."

Clements said, "I had to make my own splitters (signal power dividers), because there weren't any commercially [available]." He built "balun" transformers, to match the 75-ohm unbalanced coaxial cable to the 300-ohm TV set terminal balanced to ground, using coaxial stubs as resonant transformers. These devices were cut for Channel 4, as a reasonable compromise between the frequencies of channels 2 and 6. "One of my pet peeves," he said, "and that of my associates in Seattle, was [that we couldn't get] directional tap-off units. [We found] only one manufacturer that made these for the telephone company, and that was Spencer-Kennedy Laboratories [SKL] out of Boston. ... I think that Bob Brown and Jim MacKenzie and Ed Faust and I did more to further the development of

the directional tap. ... [The other manufacturers] all made pressure taps, where you just cut a little hole in the cable and [insert] a device [called a 'stinger'] to make contact with the center conductor. This was fine; it worked fine, and everybody used them. Still, it caused a little reflection. Technically, it's a bad device.

"Finally," he said, "I got [the design engineers at Jerrold and Entron] together in Wheeling, West Virginia ... for a demonstration I was giving to West Virginia operators ... on the advantages of a directional tap. We had set up a sweep generator and a scope with detectors so you could actually see the reflection caused by a pressure tap and what a directional coupler tap did. The industry responded and suppliers started developing their own directional taps. ... All of those thousands of pressure taps that were in the systems were terrible devices."

ILLEGAL BOOSTERS

In the mid-1950s, according to Clements, some energetic guys would say, "We can't economically justify wiring up this little community for cable. But we'll get some signals off-the-air up on the mountain. We'll put them on an antenna and amplify those signals and beam them down to the community ... which," Clements said, "was highly illegal. They called them boosters. The first one I knew of was right here, thirty miles away, in Bridgeport, Washington. ... They would just take one of Ike Blonder's [Blonder Tongue] amplifiers and run the signal through the amplifier and beam it on an antenna ... over the town." This was probably about 1954.

Clements said, "[George Frese] was probably one of those who promoted the booster. He kind of gave them the idea. But he was a professional engineer, so he said, 'This is illegal. You cannot ... transmit a signal without a license.'... But that didn't bother these entrepreneurs, these little guys who had the television shop in Bridgeport." They said, "If it works, we're going to do it. We're not going to bother anybody." The idea caught on, and boosters began popping up throughout the Pacific Northwest region: in Idaho, Montana, Oregon, and Washington. To mitigate concern over illegality, they began to refer to these devices with the more benign sounding term, *reflectors*.

Although illegal boosters were being installed mostly in tiny villages, many with less than a hundred or so population, Cable TV operators became alarmed. Clements said, "Many of the cable operators saw them as a possible threat to their business in the late 1950s. They thought these people aren't going to buy cable [because] they get nothing more [on cable] than they get off of this illegal booster."

After considerable prodding by cable operators and the NCTA, the FCC ordered a hearing that was held in Wenatchee. J.D. Bond was the administrative law judge (known as a hearing examiner in those days) for the FCC. To the consternation of the cable operators, Bond ruled that, even though technically illegal, the boosters were like unlicensed "baby buggies on the highways of commerce," doing no harm, and should be permitted to continue to operate. According to E. Stratford Smith, counsel to NCTA, "Even the FCC could not swallow that one

and overruled the law judge, but set up a legal translator service, after considerable prodding by western states congressmen. The boosters did not become a big problem in Pennsylvania or other East Coast states."[2]

A bill was introduced in Congress, through Washington Senator Warren Magnuson's Interstate and Foreign Commerce Committee, calling upon the FCC to authorize some means for receiving television signals in places like Bridgeport. Clements said, "I was one of the few cable operators who supported it, because I knew these people couldn't afford [the cost of cable]. ... I saw the need for it." Many operators were afraid of the competition. The FCC adopted regulations authorizing "translators" that would be required to convert the signal received off-the-air to a different frequency for transmission, generally on UHF channels 70–83. VHF translators, on channels 2–13, were later approved, under specified conditions.

TELEVUE—THE BERGREN GROUP

In 1953, Clements became involved with Homer Bergren of Seattle, Fred Goddard of Aberdeen, and Harley Steiner, who was the chief engineer of the radio station at Lewiston, Idaho. Bergren was a principal in the Smith and White Company, which had built the first electrical power transmission lines through Waterville, carrying power from Grand Coulee Dam to central Washington. Bergren and some of his colleagues at Smith and White wanted to get into the cable television business and were looking for qualified technical assistance and participation. According to Clements, "The Bergren group either built or acquired systems in part of Seattle, Aberdeen, Hoquiam, and Pasco-Kennewick in Washington; Seaside, Astoria, The Dalles, Baker, Union, and LaGrande in Oregon; and Lewiston in Idaho. In Pasco-Kennewick, he [Bergren] was allied with Newell Priess from Spokane. In the other systems, he was a partner with Fred Goddard, Bill Montgomery, Bob McCaw and others. Elroy McCaw [prominent radio broadcaster in Oregon and Washington, and father of Bob and Craig McCaw, the cellular telephone tycoon] was a stockholder in Aberdeen and Hoquiam and had his own Cable TV system and radio station at Centralia-Chehalis in Washington."

In 1965, the Bergren group organized the TeleVue Corporation, with Clements as senior vice president. Jack Pruzan, who sold pole-line hardware to the telephone and electric power utilities, was one of the original investors in TeleVue. Clements said that TeleVue was simply the operating company for a group of systems, a multiple system operator. TeleVue put together systems in California, Oregon, and Washington, many of which were later sold off. Clements said, "We put a lot of people into [the Cable TV business]. Cox Broadcasting's first interest in cable television was when they bought systems in Aberdeen-Hoquiam, The Dalles, and Astoria. A guy by the name of Monty Rifkin [founder of American Television and Communications Corporation (ATC)] put together one of the first pension fund groups in this business, the Garment Workers Pension Fund of New York City. They bought cable systems in Baker, LaGrande, and Union in eastern Oregon. Bob

Rosencrans bought the system in Pasco-Kennewick, and that was his first entry into the Cable Television business."

Clements said, "We didn't want to take out any more debt, and we were really growing. We had done what we wanted to do." Bergren and Clements began shopping around for a buyer for TeleVue. Metro Goldwyn Mayer was interested, and Clements said, "We came very, very close to selling to the *Los Angeles Times*. ... The closest we got, before selling ... was making a deal with Bob Magness, who was putting together a public company called TeleCommunications Inc. (TCI)." That deal hung up on the value of the microwave facilities. In 1968, they finally made a deal with the Columbia Broadcasting System (CBS) to acquire all of Tele-Vue, except for systems partly owned by individuals or partnerships that were spun off into a company called ComWest.

Then, in 1970, the FCC adopted a ruling prohibiting the ownership of Cable TV systems and syndicated programs by the national television networks. CBS then spun off its Cable TV and program syndication divisions into a company called Viacom. Ralph Baruch, head of the syndication division, became chairman of Viacom. It soon became known that the headquarters would be moved from Seattle to New York. According to Clements, "That's when we said, 'Fine, you can move it.' None of us wanted to move to New York. The only one who stayed with them ... was John Goddard [Fred Goddard's son], one of the few key people. ... Homer [Bergren] and the rest of us stayed here. Then I joined Bob Magness, and I went to work for TCI in January of 1971."

According to Clements, "ComWest was a group of us made up primarily of Homer Bergren, Bill Montgomery, Bob Brown, Jerry Laufer, Jim MacKenzie, me, and all the operating people. ComWest also included the McClatchy [newspaper] group in California and the Searle group in Oklahoma that had been developed in partnership with TeleVue. There was also an equipment division in ComWest that sold equipment to most of the cable operators in the West." Clements said, "We were a wholesaler. We were a supplier. We had a good stock of supplies. We sold Jerrold equipment, Entron, SKL, and Scientific Atlanta. We got allied with Jack [Pruzan] and he went into kind of competition with us. The Pruzan Company started selling some electronics and stuff."

Then, Pruzan started expanding, and the business took off. He came to Clements one day and said, "This business! I had to go to the bank the other week and borrow a million dollars to pay the overhead, because it takes a while for the turn-around and the accounts receivable to come in. I've got to do something with it. It's getting too big for Jack Pruzan." So he made a deal with Anixter, a big pole-line hardware supplier in Illinois, and the company became Anixter-Pruzan, the leading supplier to the cable industry.

One of the earliest periodicals to begin reporting on the technical aspects of Cable TV was known as *DXing Horizons,* published by Stan Searle and Bob Cooper. "DX" is the code used by amateur radio operators (hams) with reference to long-distance reception of radio (or television) signals. The magazine covered reports of

individual television reception at long distances, as well as community antenna developments, with descriptions of the antenna type and location, and details of the electronic equipment used. But they were also writing editorials favoring the "illegal boosters," or translators, as well as Cable TV, while carrying paid advertising by Jerrold, Entron, Ameco, and other Cable TV suppliers.

By the late 1950s, the Cable TV industry looked on boosters and translators as competitors and a serious threat to its very existence. Clements was astounded to see a full-page translator ad on the back cover of the magazine. He called Stan Searle and said, "No, you have to take that translator ad out of there." "But," Searle replied, "We were prepaid a year for that ad!" "Return his money," said Clements. "That's like $3,000." And Clements then said, "If you want to be a cable magazine, you have got to get on one side or the other. You can't ride the fence." Searle broke off with Cooper and joined a fellow named Pat Pogue out in Oklahoma and put together Cardiff Publishing. Then Clements became involved in business with Searle. "[He and I] were applicants for the Yakima, Washington, cable systems in his hometown, with his father and brother. Then we became involved with Tele-Vue, and we owned systems in Oklahoma, jointly with Stan Searle. That is part of our ComWest group."

TELEGUIDE—MANHATTAN BOROUGH

Among Elroy McCaw's broadcast holdings was WINS radio in New York City. He had considerable interest in improving TV reception in Manhattan and became part owner of a closed-circuit television system called TeleGuide, whose principal was Charles Dolan. In the late 1950s or early 1960s, Bergren sent Clements to New York to see what he could do to help TeleGuide. Clements told the story this way. "Elroy [McCaw] put up most of the money for the expansion of TeleGuide, with Dolan's Sterling Information Services. He [Dolan] operated, and I became involved as a consultant. They made me vice president of engineering for Sterling. We operated a closed-circuit [system] while we were preparing for a franchise. This closed-circuit operation went to 64,000 hotel rooms in Manhattan. It was a program service aimed at the visitors. It was broadcast in seven different languages. They could turn on the television set in their hotel room ... tune to Channel 6 and that would tell them where to eat, where to go, what to do in New York. That was where TeleGuide got their revenue. ... [We placed] coaxial cables through [underground] ducts to connect these hotels."

In 1964, TeleGuide televised programs from the World's Fair to hotel rooms throughout Manhattan. However, because the fairgrounds were so far away, the telephone company was not able to provide a cable connection to downtown Manhattan. To solve the problem, Clements said, "We put in a UHF translator, just like the translators [in the villages in the mountains]. We put an antenna at the fairgrounds, and it was fully licensed by the Federal Communications Commission. I took [the application] down to Washington, D.C. I had Senator Magnuson's subcommittee counsel, Nick Zapple, walk it through. ... But it was illegal,

because I was using it for a common carrier purpose, like microwave. We rented space up on the Pierre Hotel. We put a UHF transmitter at the fairground and a receiver on the Pierre Hotel and fed the signal into our TeleGuide system. It was very popular."

Using the experience gained from the TeleGuide operation, Charles Dolan put together a group (called Manhattan Cable Company), whose owners included Sterling, Time Inc., McCaw, and others. The purpose of the organization was to obtain the cable television franchise in Manhattan. "We saw that Manhattan probably had the poorest television of any city in the United States," Clements recalled, "because of [shadowing by the tall buildings and the chaos of multi-path ghosts]. ... It was a highly contested cable television franchise, with TelePrompTer, Westinghouse, RKO General, and Sterling [in competition]. The hearings were quite lengthy. [The city] broke up Manhattan. They gave TelePrompTer the area from 89th Street north and gave Sterling everything from 89th Street south, including most of lower Manhattan and all the good side. TelePrompTer basically ended up with Harlem, the Bronx, and that part of Manhattan. They gave Riverdale to the guy who owned *Reader's Digest*."

THE SET-TOP CONVERTER

Clements was retained as consultant for the Riverdale franchise. He said, "That was a real challenge back then, because we were a little ahead of technology for New York." Of the twelve VHF channels allocated by the FCC for television in the U.S., seven were already in operation in New York City. Thus, only five positions on the TV dial could be used for programs without risk of self-interference from the local stations. Clements said, "We didn't have a converter. We didn't have a way to cure the off-air interference. So our first system there was a triple cable. ... We had a switch for the people on the first system until ... we got a converter."

The purpose of a set-top converter, connected between the coaxial cable and virtually every customer's TV set, is to isolate the TV set from the strong radio frequency signals transmitted by local TV stations. This is accomplished by connecting the cable to a separate, well shielded tuner, which converts the frequency of any incoming cable channel to one that is not used locally—typically Channel 3 or 4. It not only avoids interference due to direct pick-up in the TV set of signals from the local stations, but it also enables UHF or other non-standard TV channels to be viewed on conventional VHF TV sets.

Clements said, "That [direct pick-up] thing was a real donnybrook! Our first experience with it was in the Seattle system, where we had direct pick-up interference. We had to run the coaxial cable clear into the tuner [in the customer's TV set]." This was quite impractical. So, Charlie Clements, Bob Brown, and Jim MacKenzie devised a UHF converter. "We [converted] from VHF to UHF and then back to VHF—double conversion—to get rid of the off-air interference. It worked quite well."

At the same time, Philip Hamlin, a Jerrold sales representative in Seattle, said, "Hell, I can build those things." And he did. The Hamlin converter was well known in the industry. Meanwhile, International Television, a Paramount affiliate, patented the Mandell-Brownstein set-top converter.[3] "Well," said Clements, "this whole thing got down to a patent problem, and there was a very lengthy lawsuit. ... I was called as a witness both by the plaintiff and the defendant. ... They were trying to say who was first [to invent the set-top converter]. I couldn't pin it down to a date."

The extent to which Ron Mandell and George Brownstein were aware of the Seattle solution, or the critical New York City problem, is not clear. In 1977, Oak Electronics was licensed exclusively to manufacture the Mandell-Brownstein converter. A few years later, Charles Dolan's Manhattan Cable became the sole marketing agent for Oak's converter. Through a chain of mergers and acquisitions involving Paramount, International Telemeter, Oak, Athena, and Resorts International, effective control of the 1967 patent passed to TCI until it expired in 1984.

Jerrold had become a major manufacturer of similar dual-heterodyne converters and was sued in federal court for infringement. Jerrold said, "This is our own and we're not going to pay the fee." The matter was settled without resolving the validity of the Mandell-Brownstein patent. The fact remains that the dual conversion concept is still widely used around the world for its ability to utilize spectrum on cable not available for wireless broadcasting, as well as to avoid direct pick-up interference. Whether the idea was first devised by Clements and his colleagues in Seattle but never patented or by Mandell and Brownstein is, by now, of only passing importance.

TELECOMMUNICATIONS INC.

After CBS spun off its TeleVue acquisition to Viacom, Bob Magness hired Clements in January 1971, with the title of general engineer. At that time, Magness was president of TCI, the company he had built from a modest beginning in Memphis, Texas, in 1955. About 1973, Magness became chairman of the board of TCI and brought in John Malone as president. Clements said of Malone, "[He is] one of the smartest business heads I have ever run into." It was about this time, according to Clements, that Magness established the Class B TCI shares with ten times the voting power of Class A. "Nobody's ever going to take over TCI when Bob Magness sits there with voting control of 50 percent of the voting stock," Clements said.

For the first few months with Magness and TCI, Clements was engaged primarily in assisting the engineering staff and overseeing equipment purchases. Then Magness asked him to help grow TCI as a public company, with the official title of director of corporate development. Clements said, "When I joined Bob, we had 85,000 subscribers, I think." When he retired from TCI in 1981, it had 1,250,00 subscribers.

As director of corporate development for a publicly held corporation, Clements was deeply involved in financial projections and evaluations, drawing on his earlier experiences as a consultant. Pioneer Cable TV start-ups had to rely on personal investments and loans by friends, relatives, or local business people. Installation charges of $125 to $150 offset a substantial portion of system construction costs until 1958 when the Internal Revenue Service (IRS) ruled that such charges would be taxed as ordinary income. By then, however, other sources of financing were becoming available. "Primarily, at the start," Clements recalled, "the [continued] development of Cable TV was independently financed through local banks. Then, to my knowledge, Bill Daniels was the first one to get the industry involved with a New York bank. ... A little bit later, the insurance companies got in."

Bankers and Wall Street investors did not understand the nature of the Cable TV business. Because it was a start-up business, there was no history of earnings. Because of rapid technological obsolescence, accelerated depreciation schedules in the early years resulted in balance sheets with little or no net worth. Cable TV is a cash-flow business. In layman's terms, "cash flow" is loosely defined as the difference between gross revenue and operating expense. "There was one point in time," Clements recalled, "when TCI had a 65 percent cash flow." That is, 65 percent of its revenue was available for purposes other than paying operating bills. He went on to say, "That's the only thing that kept us alive when those interest rates in the 1970s went up to 20 percent, because we were a heavy cash-flow business. We could retire debt. We could pay 30 percent of our total revenue for interest, which we did. ... There is hardly any [other] business that can stand that sort of prime interest rate on debt. ... To retire that sort of debt takes all of your operating capital just to pay the interest."

In the early 1970s, Magness and Malone felt so strongly about the potential value of satellite services for cable television that they wanted to acquire their own satellite. "Then Hughes Aircraft came out and said they will put one in the air. RCA said they will put one up. I think in 1975 there was a commercial satellite up there. Most of the services, I think, were handled by Southern Transmission Company. They did the contracting between the supplier and the satellite."

Then, according to Clements, "Ted Turner wanted a half hour with TCI executives to sell his concept of putting [his] independent television station [WTBS Atlanta] on this transponder up there." This was Clements' first meeting with Turner. He said, "We met in the board room. There were about ten of us. Ted Turner, walking around the table, speaks for an hour or an hour and a half." Finally, Clements recalled, Turner said, "Screw ya! I'll do it myself." Commenting on the meeting in his Oral History interview, Clements said, "Turner had sold himself on the value of that satellite and in getting programming from his little independent television station, Channel 17 in Atlanta, to a national audience. He had sold himself on it at that meeting with TCI. I'm firmly convinced of that."

NCTA BOARD OF DIRECTORS

Charlie Clements recalled that in June 1952, right after the FCC freeze was lifted, he attended the first national convention of the newly organized NCTA, held in New York City. He said, "Martin Malarkey, Strat Smith, Bill Daniels, and some of the old-timers had just formed the association, in 1951. ... Strat Smith and Marty Malarkey were really the founding forces of cable television in this country, in my opinion. ... I got to know most of the old-timers. Bob Tarlton was one of the first. He was doing in Lansford, Pennsylvania, what I was trying to do here [in Waterville]. I think Bob opened his system about the same time I did or maybe a little before."

Clements was elected to the NCTA Board of Directors in 1957. He said, "I served on the board the first year with Homer Bergren. The next year, I became secretary, and I was vice chairman and secretary for three or four years." Board members were elected for a term of three years, not including periods of service as officers. Clements said, "That is how several of us—Frank Thompson, Bill Adler, and I—got very active in the trade association. I made lots of contacts in the industry." About 1961, NCTA appointed a committee to develop a glossary of terms used in Cable TV. Clements said, "We found in the late 1950s or early 1960s that many people in the industry had different ways of expressing different terms, particularly on the technical side. The committee, which [consisted of] Archer Taylor, myself, and two or three others, tried to standardize the terminology to be used in the Cable TV industry, and we were successful at it."

Clements said, "Early on, I was very active politically with Senator Magnuson (D-Wash.). I was [Democratic] party chairman in his district and became very well acquainted with Senator Magnuson and Senator Jackson (D-Wash.). Senator Magnuson was chairman of the Senate Interstate and Foreign Commerce Committee that had jurisdiction over broadcasting and communications. A lot of people [on the NCTA Board] thought that we ought to put cable television under some sort of licensing or some sort of control. I worked with Magnuson on that. We made history with Senate Bill 2653, which would have put cable television under the FCC."

Stratford Smith worked tirelessly with key members and staff in Congress to draft appropriate legislation. In 1959, the Subcommittee on Communications of the Senate Interstate and Foreign Commerce Committee drafted Senate Bill S-2653.[4] Senator John O. Pastore (D-R.I.) was chairman of the subcommittee that held hearings on the bill. Clements said, "I was very close when we wanted to get a pulse on what senators thought about Senate Bill 2653 and others that really affected our industry." Many members of the association, especially board members, also were well acquainted with their own senators and lobbied vigorously for passage of S-2653.

"We had a lot of internal opposition to it in our industry from Jerrold Electronics (who were also cable operators)," Clements recalled, "which I didn't realize."

Shortly before the bill was scheduled for a vote, Milton Shapp, president of Jerrold, sent an astonishing call to NCTA members to attend an urgent meeting calling for the *defeat* of S-2653, rather than its passage. Clements said, "I thought everybody in the industry wanted it. I was mistaken. So was our Washington, D.C., staff. ... A fellow from Oklahoma, Henry Griffing, was very, very powerful politically." Shapp had been working with Griffing on the Bartlesville, Oklahoma, home theater project. The two men believed that the industry neither needed nor wanted any regulation at all.

"When S-2653 finally got down to a vote [in the Senate in 1960]," Clements said, "and after many days of hearings, we got beat by one vote. It was the first time in the history of the United States Senate that a bill introduced by the chairman of the committee was defeated. ... The industry defeated it. ... I didn't realize there was so much opposition to the bill." Senator Pastore, who had personally conducted hearings on the bill, was particularly bitter about being "double-crossed" by NCTA members who came to lobby for defeat of the industry's own bill. The industry lost a number of important friends in the Senate. Clements said, "S-2653 was a good bill, but there were those who, like Henry Griffing, just didn't think we needed any regulation. He said we were too early, the industry was too young."

Griffing was president of the Video Independent Theaters chain in Oklahoma, whose subsidiary, Vumore, operated several Cable TV systems in Oklahoma. Clements said, "Henry [Griffing] was one of my clients. He and his whole family, unfortunately, were killed in a plane crash right after one of our meetings in Washington. Henry was really the first entrepreneur in pay television. He built the Bartlesville, Oklahoma, system for pay television. It was the very first experiment with pay television. It was a failure, financially, but it proved to Henry that there were people who would pay for programming without commercials."

CLEMENTS AS A CONSULTING ENGINEER

Through association with other cable operators on the NCTA Board of Directors, Clements recognized a real need for consulting engineers in the late 1950s and early 1960s. He said, "There were only two of us known. One was a good friend of mine from Montana named Archer Taylor. Archer was on the staff at the University of Montana in [Missoula]. He was building a cable system of his own in Montana. He finally left his position at the university and joined Marty Malarkey. They had a consulting firm called Malarkey Taylor & Associates that still exists in Washington [as of August 1988]." Clements said, "I did consulting work for Time-Life, CBS, ITT, several newspapers ... several manufacturers of Cable TV equipment, and others.

"In the early 1960s," Clements said, "my role as a consulting engineer became primarily [concerned with financial matters]. Most all the work I did was financial projections and feasibility of a system. I'd go in; we'd survey; we'd check the off-air reception in the area. We'd figure what we could build the system for. I

knew, almost to the penny, what it would cost to build a cable system. I knew, pretty much, by looking at the demographics, what percent of people we figured we could sell. This was prior to the time of the satellites. ... Early on, all we had to sell was improved reception services."

For a time, the FCC refused to permit cable systems to use microwave to relay television program signals. As an alternative to microwave, Clements was one of the few pioneer innovators to use the patented "surface wave transmission line," dubbed G Line in honor of its inventor, George Goubau. G Line consists of a single No. 9 wire, coated with three-eighths-inch polyethylene insulation. It interfaces with coaxial cable by means of devices called "launchers" that look like long narrow funnels at each end of the single, insulated wire. As long as the wire is perfectly straight, with no bends or corners, the losses are very small. Any curves need to be quite gentle. Sharp curves require transforming to coaxial cable and launching again back to the G Line.

Clements said, "We had several of them. Some of my cohorts in TeleVue and I did several G Line systems for a client in south Texas—Brownsville, Pharr, McAllen, that whole line of systems." In Ardmore, Oklahoma, a good friend had proposed a microwave system, but the FCC was not granting microwave for cable systems at that time. So, Clements said, "We laid out thirty- or forty-mile antenna runs from [the receiving site] to get into town." He also engineered a G Line system for a client in St. John, New Brunswick.

In south Texas, Clement said, "We also used huge parabolic antenna arrays, which is another unique thing I did." A simulated parabolic reflector was constructed by attaching many horizontal wires, spaced a few inches apart, on several tall telephone poles (sixty-five to eighty feet) set in the ground in the form of a parabola. Clements said, "Take a huge parabolic antenna, and it would cover a quarter mile. What it did was gather all this signal and shoot it into one little antenna and put it on the cable system. That's the way we were able to get signals sufficient for a Cable TV operation. ... I built one in Texas. ... I engineered a system for a client in St. John, New Brunswick; ... and I built one up in the Hudson Bay area in Canada for a client. ... That was a way to get distant signals, because in Canada you couldn't use microwave ... absolutely prohibited." The antenna was capable of receiving very weak signals, with sufficient directivity to minimize noise and interference.

In addition to Canada, his consulting work took Clements to South America and Australia. In nineteen cities within 75 to 100 miles outside Buenos Aires, Argentina, Luis Perfilio built cable systems for Pro-Artel, a broadcasting company with television stations in Caracas, Venezuela; Rio de Janeiro, Brazil; and Buenos Aires, Argentina; in association with Time-Life, CBS, and Gore Maestre. According to Clements, "Luis Perfilio was an ex-colonel in the Argentine army and ex-minister of communications under Juan Peron. ... In the mid-1960s, the economy was very good in Argentina particularly and also in Caracas. Then with the political change in the late 1960s, I think it switched over so that Brazil was probably the best area

[for Cable TV]. ... Caracas was made for Cable TV, with one exception—there are no utility poles in Caracas. It's a 100 percent concrete city. Everything is underground in ducts, like Manhattan. But nobody has any maps of the duct system. ... It would be very, very costly to put a cable television system in Caracas." He said that TCI once proposed over-the-air pay television for Caracas and other cities in Venezuela, but, at the time of his Oral History interview, he was not aware of the status.

In the early 1960s, Clements was engaged as a consultant representing the City of New York, Borough of Manhattan, in a lawsuit against the New York Telephone Company. Clements said, "I was their only witness. What happened was that a fellow named Harold Sugarman, doing business as Bell Electronics, had some master antenna contracts in apartment houses in New York along Central Park South and 57th and 58th streets. Sugarman went to the telephone company and had them tie together these apartment houses. Well, they were crossing streets in New York and usurping the franchise. They said they didn't need a franchise to connect those two apartment houses together. All they were doing was leasing the line from the telephone company. ... Morris Tarshis, head of the Bureau of Franchises in Manhattan, became very upset ... because they [the telephone company and Bell Electronics] were usurping the franchising authority of New York [City] ... [They considered this] a very important case, because if the franchising authority wasn't legal, they [the city] would lose millions of dollars on franchising taxicabs, bus routes, subway concessions, etc. They thought that New York Telephone Company was telling the city [they] don't need a franchise.

"So this went to court in the early 1960s," Clements continued. "We lost it in lower court. The telephone company came in with eighteen of their top design engineering staff from the Bell Labs and convinced the judge that the minute the television signal went into an amplifier, it was totally destroyed, and that it was a different signal when it came out the other end. They weren't taking the signal from point A to point B; they were taking a signal and destroying it [at point A] and recreating it at point B. The City of New York appealed and we won the case on appeal. It [the telephone company argument] was ridiculous!"

NOTES

1. *Charles E. Clements, An Oral History,* interview by David Mercer, August 1988 (Denver: The Cable Center).
2. *E. Stratford Smith, An Oral History,* interview by Pat Parsons, March 1986 (Denver: The Cable Center).
3. U.S. Patent No. 3,333,198, filed December 1965, issued July 1967.
4. E. Stratford Smith, "The Emergence of CATV: A Look at the Evolution of a Revolution," *Proc. IEEE* 58 (July 1970): p. 974.

CHAPTER 8

JOSEPH S. GANS III

Joseph "Joe" Gans is one of the intrepid pioneers who started Cable TV systems in Pennsylvania's Lehigh Valley coal region in 1949–1950. Bob Tarlton was already beginning to connect customers in Lansford; John Walson had some customers in Mahanoy City; and Martin Malarkey was building his plant in Pottsville. With a love of radio and electronics and an insatiable curiosity, Joe Gans not only built most of the equipment for the Hazleton system in the early days but also manufactured equipment for other operators as well. He is currently president of Gans Multimedia Partnership, a multiple system operator based in Hazleton. Joe Gans' story is told largely from his Oral History interview with E. Stratford Smith in October 1989.[1]

PERSONAL HISTORY

Joseph S. Gans III was born in Hazleton, Pennsylvania, August 13, 1926. His father and grandfather were both named Joseph, as are his son and grandson. Just after the turn of the century, Joe's father immigrated to the United States from Russia, as a small child with his parents. His mother, Anna, also came from Russia with her parents, a few years later. They came as farmers, but Joe's father found employment maintaining the electric power generator used to run a trolley between Hazleton and Wilkes-Barre. Joe's brother, Ed, is manager at John Walson's Wilkes-Barre Cable TV system. Another brother, Ted, worked in cable for a short time. His sister, Lorraine Hofgale, is a computer programmer. In 1947, Joe married his high school sweetheart, Irene. They were both from pretty poor families, and Irene went to work in the dress mills. They have two children, Joseph IV and Janice, and three grandchildren, Joseph V, and Janice's two children, Jeffrey and Jennifer. Joseph IV has always worked in his father's cable company.

As a boy, Joe was intrigued by radio. He would visit the radio store in town, and for a dollar or two buy any radios that had been traded or were considered problems. Then, for four or five dollars, he would sell whatever radios he could fix. As he said, "It was all trial and error. I got a lot of good electrical shocks. ... I would pick up about four radios, and out of the four make two good ones by switching parts back and forth." This was the time of the Depression, and he kept pretty busy, by word of mouth, using his bicycle for delivery.

Then, when he became a teenager, Joe played the accordion, often playing and singing songs with his friend Richie Danko, who played the violin. He said, "One thing led to another, and they got us on the Major Bowes Amateur Hour [on radio]." A policeman in Hazleton volunteered to take them to New York—in the sidecar of his police motorcycle! They did not win any prizes, but they did play for the police convention and other events in Philadelphia. By the time the boys graduated, in 1944, they had grown to a nine- or ten-piece band. In the meantime, Joe signed up to work in a machine shop in Hazleton, learning to operate lathes and milling machines. To help the war effort, the shop was building launching equipment for PT boats. It was a busy schedule for a young man in high school: pursuing his music, repairing radios, and fabricating aluminum parts.

Joe Gans was inducted into the Signal Corps in November 1944. He was assigned to an infantry battalion where he set up communications with the Patton Fourth Armored Division in Germany. Before returning to England, he was sent to Czechoslovakia, then to southern France and Switzerland. He was discharged in August 1946, as a corporal. Gans said, "When I came out of the service, I was pretty much interested in radio. That's when I got my FCC [amateur radio operator's] license: W3FZW." He began playing again, with bigger bands, and began teaching, primarily the accordion. He said, "Up until 1952, that was our main source of income, playing with the bands and teaching music."

Gans said, "We lived down on Garfield Street, down in town a little bit. In fact, I think I was still in school when the local department store [Leeder's] was looking for someone to service the sets as well as to install the antennas. They asked me to do it. ... First, I did the [radio] service work for the Leeder store. ... Then from there we went to New York, New Rochelle, to pick up some TV sets. It was not easy to get a franchise from RCA or Philco, because they were pretty well tied up with the bigger stores. It was a set similar to Dumont that we picked up. The TV sets were delivered to my home. Even though they were brand new, we had to get them working—in my attic. We had to assemble them, put in the vacuum tubes, and make them work; we had to get a picture. It was quality control, I guess, and at that time, there wasn't any. ... In the meantime, the department store was down in the center of town, where they couldn't demonstrate them. There weren't any pictures there. [So], we would sell to people who lived in higher elevations, where we could get their sets working."

Gans recalled, "It started in the attic of the home that I lived in, which was in the lower part of town. Then we built a new building. Actually, it was an apartment up on a higher section of town where television reception was a little bit better and it was easier to demonstrate the pictures. ... These were the harder times, the way we built the building. The one side of the store was where we demonstrated the TV sets, and the other side we actually lived in, because we didn't have enough money to finish the upstairs. We finally later did finish it, and we did move up there. That's our main [Cable TV] office now. ...Then we built a home up on top of a

mountain, where the pictures were even better. From that, we developed into the television sales. ... But everything started up there on Ninth Street."

In 1948, Gans used his GI Bill benefits to enroll in the Hazleton Electronics School. "I always loved radio and electronics," he said. "I decided to go to this Electronics School, because this was the kind of future that I was looking for. ... College was one route to go, but it seemed to me that this [Electronics School] was more of the specialized type of training that I was looking for, and it fit more into what I wanted to do." At the school, they built their own Heathkit television receivers and their own antennas. Signals were so weak they had to put little boosters on them to improve the reception. Gans said, "I guess it was good luck that the school ... was also on top of a hill in Hazleton. We put an antenna on top of the roof there, and we were able to watch the Milton Berle shows back in 1948–1949."

Introduction to Cable Television

Gans finished school in June of 1950. His instructors at the school, Chris Lucian and Paul Wentzel, talked about the possibility of starting up a cable television system in Hazleton. Bob Tarlton was already building a system in Lansford, and John Walson had started one in Mahanoy City. But Gans told his former instructors, "I'm doing so well with the television store that I don't know whether I'd have time to look at something like this." But in August of 1950, he visited the Philco distributor in Pottsville. He said, "Pottsville is strictly a cable town. It's down in a hole with mountains all around." But when he walked into the Philco distributor's shop, he said, "All of a sudden I saw a television picture." So he asked, "Where in the world are you getting this picture from?" And the distributor answered, "It's from cable, but the cable's off half the time. It's no good." (Author's note: Since Martin Malarkey opened his system in Pottsville early in 1951, outages in August 1950 were probably caused by construction in progress.)

Moreover, Gans recalled, "Where I lived and where I had my TV store was on one of the higher points. I had a tower up about twenty or thirty feet, and we'd get pictures out of Philadelphia that were halfway decent. Two blocks away from me, in a shadow behind the hill, there were no pictures at all. Combining this with what I saw in Pottsville, where they ran the wire down off the antenna on the mountain, I knew right then and there that this was the industry to get into. Here's a way to get pictures down off the mountain into the homes. I couldn't get home fast enough." He called Lucian and said, "Chris, I am definitely interested in looking into cable. Let's see what we can do with it."

The Corriele Family and Mountain City Television

"In the 1950s," Gans said, "Chris Lucian, who was my instructor, taught me the propagation of radio waves, especially the VHF. ... [The Corriele] family in Hazleton was successful in the coal business. This is anthracite country. The family was very wealthy. ... Somehow, Chris Lucian met with them and interested them in building the cable system. One of the big reasons was that they liked sports. There

was a man named Frank Corriele who was ill at the time. I don't remember what he died from. This man was actually bedfast.

"I think what helped them to become interested in it," Gans continued, "was a [boxing] fight in New York in December of 1950 or January of 1951. ... Palmer Corriele [and some other people] came up to the store and were able to see the fight that was being held that night. Palmer Corriele and Chris Lucian got together, and they gave [Frank Corriele] enough money to get the thing started. Frank Corriele's home was the first one connected to the cable."

In response to a question from the interviewer about his co-workers, Gans said, "Jimmy Boyle, Charlie Giking, and [Wally Masada]. They were more or less my lead people. But I had to do it myself. It's not that you go tell someone what to do, because if something went wrong, I was the guy responsible." From the receiving antenna at Gans' TV shop on the hill, it was a rather long haul down to Corriele's home in Hazleton. "We were pretty deep with amplifiers, maybe twelve or thirteen amplifiers into Hazleton. We were building the system right up until the time for the fight to start. It was crude. We had to solder splices, using acetylene torches, since we didn't have power generators or standby equipment. The antennas were what you would buy at the local TV dealer. The stacking of the antennas—we had to figure out how to do it ourselves. The amateur radio handbook was one of the most popular things that we had. ... It was close to ten-thirty or eleven o'clock at night when we made the last splice." Then the word came from Corriele's house: "We've got a picture over there in Hazleton!"

When they got the pictures so that Frank Corriele could watch the prize fight, the rest of the public in Hazleton wanted to subscribe. The Corriele family organized a corporation called Mountain City Television. Gans said, "I believe the Corrieles did invest the money, cold cash. Whether they borrowed it or not, I don't know, but they invested the money to make this work." Gans was hired as chief technician, but he had no shares in the corporation. Frank Dilscher, a distributor for Jerrold equipment, brought Milt Shapp, founder and president of Jerrold Electronics Corporation, up to Hazleton and offered Mountain City Television Jerrold's service contract. Gans recalled, "I think it was to help design or something." Under the service contract, Mountain City would be obliged to pay Jerrold $5 out of each $125 installation fee, plus 25 cents out of each monthly service charge (typically $3.75). Gans said, "I think it was later found to be illegal." So, he proceeded to build his own equipment.

About 1951 or 1952, Gans visited Martin Malarkey and the rest of the group who organized the National Community Television Association (NCTA) in Pottsville. He recalled, "We had meetings at the Necho Allen Hotel. I remember [Malarkey] sitting at the desk. Channel [51] was going on the air with a super high-powered UHF station. The talk was that it was going to put cable out of business. ... I went down with some people from Hazleton, out of curiosity, to see what this was all about, and what we might be able to do. Was he going to put us out of business? Or just what was going to happen? ... The power [and telephone

companies] were telling us that this business would never last; that [the Cable TV] people would be off the poles in a couple of years; and that UHF and VHF transmission was just going to put [us] out of business. ... Nobody really had any faith that cable was going to do anything."

As it turned out, when the UHF transmissions started, Gans said, "We couldn't even pick up a picture." The Reading station was not affiliated with any network, so the programming on cable from Philadelphia was far superior. At one time, the Reading people even offered to buy the equipment needed to put their signal on the cable in Hazleton. Gans believed that the Reading television antenna pattern was not properly designed, in that it seemed to overshoot the town itself (a common problem in the early days of UHF broadcasting). In a few years, the station went dark. The station now operating on Channel 51 in Reading began broadcasting in 1980.

The installation fee, treated at the time as a tax-free contribution-in-aid-of-construction, was a major source of funding. The Corrieles were good to Gans. He said, "Any time Jerrold or Raytheon or anybody had any kind of school, [the Corrieles] paid my way and I was free to go. I started out getting $69 or $72 a week, and they would give me a raise. I never would ask for a raise. I loved this cable so much that I would start out at six or seven in the morning, and we'd work until dark when we couldn't see any more."

Initially, the antennas and headend were located on Jeansville Mountain, south of Hazleton, receiving channels 3, 6, and 10 out of Philadelphia. Mountain City Television built a wooden six-by-eight-foot "shack" to accommodate the electronic equipment and erected a 150-foot tower for the antennas. Then they started building a distribution plant on the south side of Hazleton, where television reception was almost totally shadowed by mountains and Cable TV was the only way to get television in this part of town. They did not build on the north side of Hazleton where fair quality pictures could be received, although with some difficulty. The north side of town is on the south slope of another mountain, facing toward Philadelphia.

"I could tell you a lot of stories about that original site," Gans recalled. "We put up antennas, and an ice storm would come through and knock them down." Ice on the antenna elements first causes loss of sound. Then, as the ice continues to build, the picture goes out also. So, as Gans told the story, "Late one night, when the phone was jumping off the hook, we figured that you could climb up there, but it would be dangerous [with the ice]. Then we thought that maybe we could shoot the ice off. We started out with No. 8 buckshot. We got some ice off; some sound came back but not enough. This was the middle of the night, and we were doing everything possible to get the system going again." So Wally Masada said, "Instead of a No. 8 shot, let's try a No. 6." So he did, and they got some more ice off. But, Gans said, "Wally, that's enough. At least we can still get back tonight." And Wally said, "I'll bet if I give it two more hits, it would clean it off."

So, Gans said, "Sure enough, he took two more shots and away goes the antenna. He shot the whole thing down!"

Gans said, "All I ever did was talk cable, cable, cable!" He was beginning to think of adding more channels and starting new systems. Yankee baseball games are broadcast from New York on WPIX television Channel 11. Because there are lots of Yankee baseball fans in Hazleton, Gans put up another antenna at a site south of Hazleton. Reception on Channel 11 was marginal, at best, Gans concluded. "We were getting the ball games, but we were getting it a little bit more on a skip [reflection from an ionized layer in the upper atmosphere]. We would get it three or four days a week, and some days we didn't receive it at all." He converted Channel 11 down to Channel 5 and broadened the Channel 6 strip to cover Channel 5. Then he put it on the cable to see how it would work. Chris Lucian bawled him out, saying, "The picture's coming in and out. It's snowy. .... I don't think we should carry that picture." But, Gans said, "Half the guys at our place were ready to throw him out, because the Yankee ball game is on ... even though I must admit you would see the batter for a few minutes and then he'd disappear."

To Gans, "This [showed] the appetite the American public has for a variety of programs." So, they began looking for a better site north of town, where reception of WPIX Channel 11, and the Yankee ball games, was a bit more consistent. Gans said, "It took a bit of doing, but I talked the [Corrieles] into buying property on top of the mountain and building a new antenna site ... where the antenna [and headend are] located today." Besides Channel 11, they were also able to receive WCBS Channel 2 and WNBC Channel 4 from New York. Their new headend "shack" was, in fact, an old bus. Gans said, "We drove the bus up there, put the electronics in it, and that's where we were getting the Channel 11 picture."

WORKING WITH JOHN WALSON

One day Gans and some of his crew were up at the antenna site watching the baseball game when two guys drove up in a Cadillac. They introduced themselves and said, "I understand that you have Channel 11 up here, and the Hazleton [Cable TV system] is now carrying the ball games." This was John Walsonavich and his brother Pete. (John later changed his name to Walson.) They asked Gans, "How are you getting these pictures?" In his interview, Gans recalled the thrill of this remarkable event. "They came up in a Cadillac, and I'm sitting here in this old broken down bus. This, I guess, is a milestone in my life in cable television." The Walsonavich brothers were putting together a five-channel Cable TV system in Mahanoy City, but apparently Hazleton was the only place where the Yankee baseball games were being carried on cable. Gans was building his own equipment for the Hazleton system and had begun to build another system in Weatherly, a small village in a deep valley, about eight or nine miles to the east of Hazleton. He showed John Walson how he converted Channel 11 down to Channel 5 by modifying the oscillator circuits in a tuner removed from a regular TV set.

According to Gans, John Walson had found, by much trial and error, that by tuning the pre-amplifier at his headend to the picture carrier, he could suppress the sound carrier enough so that it would not cause interference to the upper adjacent picture carrier. This enabled him to carry the five low-band VHF channels, 2 through 6 (54–88 MHz). Gans said, "The interesting thing about it is that John was showing a five-channel system in Mahanoy City at the same time Jerrold was having a seminar proving that it was impossible ... because of adjacent channel interference. Caywood Cooley was the speaker [at Jerrold's seminar]." Furthermore, Gans confessed, "Even I argued with John. ... It's impossible that this thing would work. ... 'John, you're not going to have sound. You're tuning the sound out. You're tuning the picture.' " But John Walson said, "No. Let's go down. We'll see." And Gans had to admit, "Sure enough. That was the first five-channel system that I ever saw."

Luther Holt was making an amplifier for John Walson that was similar to Jerrold's amplified distribution outlet, better known as the ADO. The ADO was designed for Jerrold by Don Kirk as a broadband cathode follower vacuum tube circuit to isolate the television sets displayed in a dealer's show room from disturbances in the coaxial distribution network to which they were connected. By adding a couple of stages of gain, Walson came up with what Gans believed may have been the earliest five-channel, *broadband* amplifier.

But Walson had a problem. The signal loss in coaxial cable increases when it gets warm during the day and decreases in the cool of the night. During the day, the signals were weak, causing "snowy" pictures. At night, the signals were so strong they overloaded the amplifier and distorted the pictures. Gans said, "Pete [Walsonavich] used to go out in his Cadillac every morning and turn up the [gain at each amplifier] manually. Then, in the evening, as the sun set, he would drive his Cadillac back through [the system] and turn it down. This was a daily routine for him." As a matter of fact, Gans explained, "On John's system, the amplifiers were down [close to] the ground, where you can walk up to them ... without taking a ladder and climbing up all those poles twice a day. ... One of the things John did was to put a regular refrigerator control, [arranged to adjust] the gain control on the amplifier according to the temperature. ... It was not all that accurate."

This is when Joe Gans and John Walson got to know each other quite well. Gans said, "He used to come up to my house every Sunday, and we'd talk television and cable." Walson brought Gans one of the modified ADO amplifiers Luther Holt was making for him. Meanwhile, Jerrold had manufactured single channel amplifier strips with automatic gain control (AGC). Gans said, "I took the AGC circuit out of the [Jerrold] strip amplifier and inserted it in the broadband [ADO] amplifier that Johnny had. Rather than using the picture [signal for control], we put a pilot tone in there. There's where we more or less started one of the first broadband, five-channel, automatic gain control amplifiers."

In the November 1953 *NCTA News Bulletin,* it was reported that "Jerrold Electronics Company ... displayed five-channel community antenna equipment on

October 15 to thirty-seven operators at a meeting in Mahanoy City, Pennsylvania. It featured flexibility, expandability, efficiency and complete control of signals through the use of individual channel amplifiers [strip amplifiers]. ... And that the Service Electric Company, John Walsonavich, Manager, also distributes 5-channels and lays claim to a 'first.' " This claim may have been based on the broadband, AGC amplifier developed by Gans and Walson, working together.[2]

Gans was not only responsible for operating the Mountain City Television system at Hazleton, but he was also working as a consultant for both the Corrieles and John and Pete Walsonavich. In addition, he was manufacturing equipment for Hazleton and a system that he was building for himself at Weatherly, as well as for the Service Electric Company systems at Mahanoy City and at Danville-Milton. Gans said of his manufacturing facility, "It was just a crude shop. ... One trick I got from John Walson: we used to wind our coils with some pretty crude stuff. He took a washing machine, the old [type] wringer-dryers. He put the wire in there and turned on the washing machine wringer to wrap the coils." Gans estimated that he had about twenty-five employees in the Hazleton group, for both manufacturing and system operation.

MICROWAVE

Anxious to improve reception of Channel 11 from New York, Gans and Walson once considered the new radar technology using huge sixty-foot (probably twenty-meter) parabolic antennas installed for the military DEW (distant early warning) system in northern Canada. Gans said, "We figured if the radar system and the transmission reception are that good, maybe we should take a look at it and see if it would improve our pictures out of New York. This, again, is the way John Walson jumped into something real fast." Gans was at his brother-in-law's wedding, on a Saturday afternoon, when Walson came up to him and asked, "Are you ready to go?" Gans replied, "Go where?" John said, "Up to Massachusetts and get this antenna." "But John, I'm at a wedding!" "You're here long enough." So Gans and one of his co-workers got in the car with John Walson and his brother Pete. They drove twelve hours non-stop. "If you knew John," said Gans, "he just talked continuously, never stopped." When they got to Boston, they were told the antenna was specially made, and that it would cost at least $60,000 to put one together for them. That was a lot of money for an antenna, and they were not sure whether or not it would work. So they turned around and went home.

In 1956 or 1957, the Corrieles sent Gans to a convention of the Institute of Electrical and Electronic Engineers in New York, where he saw a demonstration of microwave equipment. He came back from the convention about four or five o'clock in the evening. John Walson came over, and they talked about the microwave. Gans said, "I told him it's a better way of getting pictures. I told him we could take a shot and get about thirty miles closer to New York." They knew the microwave would work, and Walson said immediately, "Let's get in the car. I want to see this thing." And Gans said, "Would you believe: at 6:30 or 7:00 we're on our

way up to Massachusetts ... to look at the Raytheon equipment." It had to be back-ordered, so he and one of his employees went back later to pick it up.

"Now, what do we do with it?" said Gans. "We didn't even know how to tune it. We didn't know how to set up the dishes or anything." They built platforms for the antennas on top of telephone poles on the mountain tops. John Walson was at one end of the path. Pete Walsonavich and Joe Gans were at the other end. They had no communication. They tried flashing lights, but it didn't work. They couldn't get the microwave path to work until later, after Gans got his ham license. Then, with some help from Raytheon and ham radios for communication, they finally got the pictures out of New York.

Building a Multiple System Operation

Before he met John and Pete Walsonavich, Joe Gans began looking around at other places that might be prospects for the Corrieles to develop additional Cable TV systems. He got franchises for Scranton, Pennsylvania, and Binghamton, New York. However, he said, "We found out that the mayor [of Binghamton], in order to keep us off the streets, wanted to charge us $50 per year for crossing the street." Although Gans believed they would only need a few such crossings, the Corrieles said, "No, it's going to cost us $50 per drop, and it's going to be too expensive." Gans said, "Quite frankly, they just didn't know the business. They were investors. I got home and I was a little disappointed. I wanted to build in Binghamton. I wanted to build [in] the Scranton area."

Deep in the next valley east of Hazleton, some people in Weatherly were talking about building a television distribution system. Gans said, "I figured that these people are not moving fast enough for me." Weatherly is scarcely one-tenth the size of Hazleton. Disappointed about not being able to build in Binghamton, Gans said, "We looked at the town of Weatherly, and I figured I'm going to go out on my own. In the meantime, I'm under a payroll."

He had selected the site he wanted to use for his antenna and headend but had been unable to tie it down. One day, in a meeting with the Corrieles, he was asked, "How are you doing in Weatherly?" Gans replied, "I think we can get it started, but I'm having trouble with getting the antenna site." He clearly acknowledged that he was working for the Corrieles, while working on the Weatherly project on the side. Nevertheless, one of the Corrieles said, "Would you like for me to help you out and see if I can find out who owns that property?" Gans said, "They were extremely influential people up there. Sure enough, we got the right people, and we got a lease on the land that we have to this day. They helped me build [my] first system." The first year, he had about fifty customers. One councilman said, "Is that the best picture that you're going to give us?" And Gans replied, "Well, the picture is clear." "Not good enough." said the councilman. Gans acknowledged in his Oral History that, "It was a little discouraging, but we got it working.

"In 1955," Gans said, "a man from the power company in Berwick came up to me and asked if I'd be interested in buying the Berwick system." The system was not doing well. There were now UHF stations in Scranton and Wilkes-Barre. According to Gans, everybody again said, "Cable's going to die. It's not going to make it." Nevertheless, he purchased the Berwick system for $30,000. Although the books showed 400 subscribers, an audit revealed only 68 were actually paying. Gans said, "I borrowed $5,000 from the bank. We put our house up for that. We had five years to pay back the $25,000 balance. ... We paid it off a lot sooner. You have to remember, the Wilkes-Barre stations came on, and Berwick is right in that valley. The [UHF] pictures were good. It was pretty rough going." Yankees baseball was available on Channel 11 but unreliable until he put in the microwave links in 1957. Gans said, "We managed to hold the people on the cable. ... When we got ... channels 9 and 11 [with microwave], the subscribers began coming back."

In 1963, the Television Accessory Manufacturers Institute (TAME [sic]) was organized to fight against what it called "indiscriminate Cable TV system franchising."[3] Mort Leslie, of JFD Electronics Corporation, was the chairman and founder of TAME. The purpose of the organization was "to bring all the facts to light, in the interest of the viewing public, so that a clear and authoritative choice between being a life-long subscriber with Cable TV and the owner of a paid-up antenna system can be made." A nationwide campaign was inaugurated, with copy for the media, bumper stickers, direct mailing pieces, and "instructions on how to effectively oppose a cable system—*in the best public interest.*" TAME began protesting to city councils all over the country that Cable TV was going to put the TV antenna installer shops out of business, to the detriment of the community. Besides JFD, TAME membership included Channel Master, Winegard, Alliance (antenna rotors), and the Finney Company. Gans said, "The only one that may not have been in there may have been Blonder Tongue. ... Just about every time we would go for a franchise, they [TAME] were there, up into the 1960s. ... [In Weatherly], the TV dealers were saying that I'm going to put them out of business. Quite frankly, they weren't even giving the town any kind of picture."

At about this time, Gans was going for a franchise in Reading, Pennsylvania. He recalls, "[TAME] actually had an auditorium. I was put on stage [with some of my colleagues]. All of these TV dealers and these antenna people were out there. They called us everything under the sun, [saying] that we were going to make big profits and then sell the business. Anything that would disgrace us or tear us down, they were there. ... They had all of their relatives there and everyone else there when they were shooting at us. ... They had the radio stations there, and I had to answer all of the complaints going back and forth."

In the end, however, Gans said, "Somehow we were fortunate, and we were able to convince the council and, I think, even the TV dealers at that time. Little by little, they started to realize that what kind of television you were going to get in the valley [was limited by the line of sight]. I stuck with my theory—which I

think made me what I am in cable television—that the propagation of radio waves just does not follow the valleys. It is line-of-sight transmission. Surprisingly enough, even some of the TV dealers didn't realize that. If you wanted better and more consistent television, you had to have [a clear] line of sight, or be on top of a mountain. Whether it is microwave, or VHF, or UHF, the signals do not go into the valleys."

As a matter of fact, Gans said, "Reading was a little more than we could handle [alone], financially, but the Corrieles built the Reading system." Gans had a percentage interest in Reading, as well as in the other systems the Corrieles built in northeast Pennsylvania.

By this time, Gans was working with John Walson and Pete Walsonavich. They began to expand their horizons into Delaware and Maryland. Gans said, "We applied for systems in Delaware: Georgetown, Laurel, Seaford, Rehoboth Beach, Lewes, and that whole group of areas down there." They bought a little Tri-Pacer airplane that they used to go down to Delaware. In his Oral History interview, Gans said, "I'll tell you what happened. Martin Malarkey built [the system at] Salisbury, Maryland. Then Sam Edwards, who was selling us cable, mentioned these towns just above Salisbury. I asked him if he thought it was worthwhile to build down there. He said he thought it was, because Malarkey was doing real well. There was only one [broadcast TV] channel in Salisbury, Channel 16."

Power companies balked at pole lease agreements in Delaware, so they elected to bury cables in highway rights-of-way. This got them into problems with water and gas lines and corrosion. Gans recalled, "The procedure was that we had a talk with the water companies, the gas companies, and where some of the telephone lines were. They would mark off where [their] pipes and cables were located. We designed a big tractor. It was what they called a *sub-soiler*. It's a blade that goes down and eventually cuts up the farmer's field, so that the water would sink down a little deeper than normal plowing. We put this in there, but actually, the gas lines were not where they were supposed to be, nor were the water lines going through. It was common for a guy to drive down the street, plowing cable, and hit a gas line or hit a water line and water would shoot all over the place.

"With these kinds of things happening," Gans continued, "the worst was that the highway department said the cable had to be eighteen inches off the edge of the road. What we didn't know was that the specification for putting up stop signs and other signs for the highway department was also eighteen inches. Whenever we would get a failure on the cable, we just drove down on the street. Somebody had put up a new sign. We would dig up the cable, and—sure enough—it was split in half. This being the early 1960s, the cable wasn't designed for being buried in the ground, so naturally we had corrosion problems, we had foliage problems. But, we overcame them somehow." When they installed the new strip-braid cable, developed by Times Wire and Cable, on aerial lines in these oceanside systems, they encountered particularly severe signal loss, due to corrosion and moisture contamination. Gans said, "We'd go down once a week or so and hit the

cable with a stick to get pictures at the other end." They learned later that this was a common problem with strip-braid cable.

"Another problem we had in Delaware was that [the antenna] was up in the air 200 feet, but we were carrying the Washington stations, some 90 miles away. Pictures were borderline, so we had problems with the city councils as to the quality of signals," Gans said. Then Edwards, a coaxial cable supplier, said, "Do you want to buy [the system in Ocean City, Maryland]?" Gans thought. "We were 90 miles away, and the pictures were no good. Can you imagine Ocean City trying to carry Washington [125 miles away]? It was for sale, I think, for $12,000. We had enough problems of our own in Delaware, so we never did buy it. Today, it's worth a small fortune."

Once they went to Long Island to buy some surplus towers and loaded them on a truck to take to Delaware. Gans recalled, "What we did wrong was we overloaded the truck in the back so that the wheels were partly up in the air, and we couldn't steer the truck. We were coming through the Lincoln Tunnel with these things. We were going real slow. The cops came running over. They saw what had happened, and they just waved us on and said, 'Get out of here!' "

In 1966, Pete Walsonavich developed cancer and passed away. Gans said, "We had to sell the Delaware system in order for the Walsonavich sisters to [pay the estate taxes] and maintain the ownership in the Danville system." By 1980, Gans and the Walsonavich family had expanded into northeastern Pennsylvania, New York, and New Jersey. Gans personally spent a lot of time negotiating with banks for funds. A deal with a New York bank, which would have required a personal guarantee, collapsed because Gans did not have sufficient assets to support the guarantee. He got loans from Firstmark, of Indianapolis, in 1977, but was paying 24 percent interest. He said, "We dug ourselves into pretty much of a hole." When John Malone, president of TeleCommunications Inc., bailed him out, in return for a portion of the equity, Gans was $900,000 behind in payments. He was permitted to continue operating and eventually bought it back. Gans Multimedia Partnership is a multiple system operator, headquartered in Hazleton., with more than 50,000 subscribers in several states.

JOHN WALSON'S CABLE TV OPERATIONS

Mahanoy City is in a deep hole, where television reception simply did not exist. Gans said, "The only way Walson could show pictures was to take the people up on top of a mountain where he had a sixty-foot telephone pole ... with an antenna on top." Six or seven miles to the west is the town of Frackville, which is just higher enough so that reception was possible although not very good. "The way Johnny more or less explained it to us," Joe Gans said, "was that the people [of Mahanoy City] told him that if he would get a picture similar to what he had on that pole [at least as good as the picture at Frackville], they would buy the television set from him."

In the beginning, as Gans recalled the conversations, Walson ran twin-lead down through the woods to his store, often attached to trees or even to some of the houses. The boosters he used were put in homes along the line, in one case under the porch. When the occupants went to bed, they pulled the plug, cutting off television for the rest of the people. Walson had a light bulb at the booster so you could see it for maintenance and trouble shooting, but the occupants kept stealing the bulbs, so Walson's repairman had to carry a spare. It was commonplace to have to go out and hit the twin-lead line with a stick to knock the rain off and restore the picture. "I remember well from [what Walson told me]," Gans said, "if you bought the television set from him, you got free service for a year. [Otherwise] you had to pay $2 a month." Of course, by 1954, when Gans became acquainted with Walson, this was no longer the case.

Walson claimed that he had connected customers to his community antenna television (CATV) system in Mahanoy City as early as June 1948, four or five months before either Ed Parsons did so in Astoria, Oregon, or Jimmy Davidson in Tuckerman, Arkansas. Unfortunately, Walson said, a warehouse fire in 1952 destroyed the documentation that could have supported his claim. However, from 1953 to 1966, Walson's own annual reports to the *Television and Cable Factbook* list 1950 as the starting date. For the 1967 and later editions, the starting date is listed as 1948. In the interest of giving Walson full credit, Professor E. Stratford Smith, interviewing Joe Gans, asked for his opinion on when John Walson first got into operation. Gans responded as follows:

> *Here are my feelings about it. As I mentioned, I didn't meet him until about 1954. I did see the articles, and from what he told me as to the way he did it, the thing I talked about before, with the $2 a month of free service for a year if you bought the TV from him, or else you pay $2 a month for service if you bought the system somewhere else. My feeling is that by making the subscriber pay for receiving service, be it the twin-lead or the army surplus cable, that is the beginning of the cable industry, whereas somebody who just had a piece of wire coming off a mountain, giving antenna service, I guess you would say, isn't quite a business of a community antenna system such as John had. In him explaining the twin-lead concept, plus the army surplus concept, I'd say it had to be 1948 or 1949, because that's the technology that more or less existed at the time. The reason I tend to lean towards Walson is because he charged the people in the years 1948 and 1949. I think that's the beginning of cable television.*

John Walson certainly deserves credit as a genuine pioneer in the development of wired CATV systems in the Lehigh Valley of Pennsylvania in the late 1940s and early 1950s. Whether his operation actually predated that of Ed Parsons and Jim Davidson in 1948, as claimed, has not been independently confirmed.

NOTES

1. *Joseph S. Gans, An Oral History,* interview by E. Stratford Smith, October 1989 (Denver: The Cable Center).
2. Mary Alice Mayer Phillips, "CATV: A History of Community Antenna Television" (Ph.D. diss., Graduate School of Northwestern University, 1972, updated by Phillips), pp. 9, 10.
3. *Television Digest,* New Series, vol. 3, no. 41 (October 14, 1963): p. 1.

CHAPTER 9

BENJAMIN J. CONROY JR.

Ben Conroy built his first Cable TV system in 1955, in Uvalde, Texas, home of John Nance Garner, who served as vice president during Franklin Roosevelt's first and second terms. Conroy joined forces with Jack Crosby, the Schneider brothers, and others in GenCoE, which soon merged with Livingston Oil Corporation. After buying back their Uvalde and Del Rio systems, Conroy and Crosby formed Communications Properties Inc. As National Community Television Association (NCTA) chairman from 1965 to 1966, Conroy guided the NCTA Pole Line Attachment Committee through many troublesome years. He is a charter member of the Cable TV Pioneers and one of the founders of the National Cable Television Center and Museum at State College, Pennsylvania, where he served as a director until the center was moved to Denver, Colorado. He is renowned worldwide for his mean ragtime, "boogie-woogie" piano. Ben Conroy's story is told largely from his Oral History interview by Robert Dudley in May 1987.[1]

BIOGRAPHICAL INFORMATION

Ben Conroy was born in the hospital at St. Johnsbury, Vermont, in 1923. However, the family lived in a small town called Island Pond, about twenty-five miles north of St. Johnsbury. His father came from Brooklyn to Island Pond to operate and manage a furniture store. His mother was native to Island Pond. Her father was a locomotive engineer on the Canadian National Railway. During the Depression, the furniture market dried up, and the family, including Ben, his brother Jack, and sister Eleanor, moved back to Brooklyn. The 1930s were a tough time for them.

Ben finished high school in 1941 and went to Brooklyn College, earning what spending money he could at various jobs, delivering the *Saturday Evening Post,* shoveling snow, and mowing lawns. In 1942, he got a "real job" as a stock boy at Wanamaker's Department Store, for $18 a week. The following summer, he worked at the Brooklyn Navy Yard for $42 a week, where they were building dry docks. With the money from that job, he put himself through a semester at Brooklyn Polytechnic Institute, studying mathematics and engineering in the hope of being able to enter the Naval Academy. In 1943, he enlisted in the Navy

and qualified for entry in the Navy V-12 program for officer candidates. He spent that year at Holy Cross, in Worcester, Massachusetts, and was appointed to the Naval Academy in 1944. Although he was in the Class of 1948, he completed the accelerated wartime program in 1947 and continued in active service in the Navy, with communications and radar responsibilities, until 1954.

Ben's mother was an accomplished pianist and saw to it that Ben had piano lessons in Vermont when he was less than nine years old. He became fascinated with the strange sounds of music called "boogie-woogie," played in the late 1930s by black people in Greenwich Village, New York. He visited the clubs, bought their records, and tried to imitate what he heard. He said, "Whenever there was a piano around, I'd try to get to it. I'd play the piano during lunch at Brooklyn College, and I'd do the same thing at the Naval Academy. Sometimes our ships had pianos, so I kept that up."

Ben was in Korea and could not attend his brother Jack's wedding, in 1951, to a Brooklyn girl, a friend of Ben's sister, Eleanor. Ben said, "Just to make a longer story short, I ended up marrying her younger sister. So, my brother and I are married to sisters." Ben and Toni (Antoinette) were married in 1956, in Brooklyn. Toni acclimated very well to Uvalde, where Ben had just opened his Cable TV system. Ben and Toni had six daughters in succession, and when they moved to Austin in 1968, their last child was born, and he was a boy. He was named Ben, like his father, his grandfather, and his great grandfather.

GETTING STARTED IN CATV

Ashore in Annapolis in 1954, on a thirty-day leave, Ben Conroy went back to Brooklyn to ponder whether to make a career of the Navy or do something else. His father had prospered as sales representative for several major wholesalers and had contacts in the financial community. He followed various leads suggested by his father, but his military resume was not especially helpful, and the offers were unattractive. On the beach one day, he was chatting with an acquaintance who had a couple of flyers from the Jerrold Electronics Corporation, describing community antenna television (CATV). Conroy took one home to show his father who asked, "What do you think about that?" Conroy replied, "I don't know. From the description ... it just sounds like a big promotion business. Sounds almost like a hit-and-run. I don't know as I ought to get into something like that." They talked about it for a while, but since Jerrold was located in Philadelphia, his father said, "Let's call them ... and go on down there and see what this thing is all about." They made an appointment with Milt Shapp, in August 1954.

They quickly learned what it was all about and talked about how much money it would take to start up a system. Conroy's father indicated a willingness to commit a certain amount for the investment. Shapp asked, "Where do you think you would like to settle?" Conroy was still a lieutenant in the Navy, but he said, "Well, I prefer not to be in cold climates." Then Shapp said, "We'll look around. We've got franchise proceedings pending in a number of places." With a

sly grin, he added, "One of the places we're looking at is Bemidji, Minnesota." To which Conroy quickly replied, "Oh! No! No!" Shapp agreed to keep looking around. Conroy went back to the Naval Academy and submitted his letter of resignation. It became effective on October 28, 1954, his thirty-first birthday. Then he went home to Brooklyn.

Conroy had no money. Even as a lieutenant, he was not making more than about $5,000 a year and had little savings and no credit. So his father helped him along. Conroy went down to Jerrold to attend a two-week training session, learning how to manage a system and something about the engineering. Conroy had no business training whatsoever and knew nothing about accounting. The people at Jerrold suggested he visit the Clarksburg, West Virginia, system in which Jerrold had a part ownership. They were enthusiastic about the manager at Clarksburg, Sandford Randolph (see Chapter 3). They said, "He's one of the best there is. Sandford always does everything right." Conroy spent several days with Randolph, visiting the headend, talking with the technicians, and examining office procedures, customer relations, and the whole operation.

Then he went to visit Jerrold's system at Williamsport, Pennsylvania, and went through the whole learning process with the manager, Ray Schneider. The Williamsport system was later sold to Fred Lieberman and eventually became part of the GenCoE multiple system operator organized by Conroy, Jack Crosby, Fred Lieberman, and others. Meanwhile, Jerrold had been investigating properties for Conroy and eventually recommended Uvalde, Texas, as a town that would support the kind of investment Conroy and his father could make. The arrangement with Jerrold in Uvalde was that Conroy would put up all the money for 51 percent equity, Jerrold would have 49 percent equity but would not put up anything. Conroy noted that Jerrold owned part of the Clarksburg and Williamsport systems but by no means all. As far as he knew, investment houses such as J.H. Whitney, and possibly Fox Wells and Goldman Sachs, were also equity participants in Clarksburg and Williamsport.

Regarding the arrangements with Jerrold, Conroy said, "So I think that Jerrold probably didn't have a lot of money. They had the equipment and, supposedly, the know-how—although sometimes we wondered if they really had that all the way. .... I would suspect that they had started all of these things on an equity basis, where they supplied the expertise. You bought the equipment, and they ended up with some of the equity, usually a minority position. I don't know if it was always 49 percent, or whether they got 49 percent of [our system] because we were neophytes."

At that time, in order to purchase Jerrold equipment, customers had to sign a service agreement to buy only Jerrold equipment. Jerrold would be paid a fee of 25 cents a month for each subscriber, plus $5 for each hook-up, in return for unspecified free engineering assistance. Conroy said, "This got to be known as the Jerrold 'Yellow Dog Contract.' I think eventually an anti-trust action was brought against them by the Justice Department in 1956 or 1957. They had to abandon

that. So we ceased paying anything to Jerrold on that basis." (See the "Livingston" section of Chapter 13.)

Jerrold did, however, play a major role in planning and building the CATV system in Uvalde. Lee Green and Herm Roeder, manager and engineer for Jerrold Southwest at Dallas, made the first franchise presentations to the Uvalde City Council. Adopting the franchise ordinance required three readings. Conroy was present only for the final reading in February 1955. He said, "When I got there ... the tower had already been put up ... all 400 feet of it. [The] council had hopes of getting a larger airline with regular operations into Uvalde. ... We had to agree that if the tower ever became a detriment to establishing a new airline service, we would move it." Ironically, Conroy did eventually move the tower to a new location, but for engineering reasons unrelated to airport operations.

Uvalde is about ninety miles west of San Antonio, considerably beyond the Grade B range of the two VHF television stations operating in 1955. Reception was spotty. Half the population was Mexican-American, and the economy was basically farming and ranching. At that time, Texas was suffering a severe drought. Farmers who could afford to irrigate fared rather well, but it was a very rough time for dry-land farmers and ranchers. Conroy said, "While it may have been a town of nine or ten thousand population, it really had the purchasing power of a town of six thousand. Typically, whole families would travel north in the spring to work in the beet fields or shearing sheep and return in the fall with enough money to live comfortably, although unemployed. Buying power was very low."

Construction began in April 1955, and the first section of the Uvalde Cable TV system was opened in June, with a grand opening celebration and announcement of the completion schedule for other sections. At first, the system carried the only TV stations operating in San Antonio at that time, on channels 4 and 5. A couple of years later, Channel 12, which began operation in January 1957, was added. In 1960 or 1961, the Spanish language station on Channel 41 was brought in by microwave.

Conroy's antenna site was within probably a couple of hundred yards of a 135,000-volt electric power transmission line. In hot, dry weather, it caused tiny white specks to dance around in the television pictures and even made the sound rather noisy. Conroy said, "We got good cooperation from the power people with [respect to] that noisy power line north of town. ... They would try to knock down a lot of their insulators and so on, and try to help us with our power noise problem. ... Ultimately, however, we had to move our tower. That power line noise was intolerable."

Because Uvalde was so remote from San Antonio, co-channel interference was sometimes experienced from other channel 4 and 5 stations farther down the Rio Grande Valley, or Dallas, or even Florida, depending on weather conditions. Conroy said, "I always watch the weather map, because when an occluded front was coming, I thought, 'Oh my Lord, here comes the co-channel!' It was worse in

the spring because that's when all the storms would be coming in. The phone would ring off the hook. 'We're supposed to get perfect reception here! This is just like our old antennas. What are you doing about it?' I used to tell them, 'I'm praying. Will you join me in prayer?' "

At Lee Green's suggestion, Conroy hired Faber Spires as his chief technician. Spires had a radio and TV repair shop and had worked in communications in the Army Air Corps during the war. Conroy said, "I think we both started off at a hundred dollars a week ... which was probably about equivalent to my Navy salary at the time when I left."

Bob Tarlton, renowned cable pioneer from Lansford, Pennsylvania, was working with Jerrold at the time as construction expert. Spires and a Jerrold field engineer walked the plant, surveying pole-line availability along probable cable routes, measuring footages with a calibrated wheel, and obtaining other data needed to prepare system route maps. The survey data were sent to Tarlton to prepare the maps and lay out the system design. The system was opened to subscribers, section by section, as each was completed. Tarlton would prepare the bill of materials for each section, and Jerrold contracted with a firm in Abilene, Texas, to construct the plant.

Initially, the system was designed with Jerrold's W-Series three-channel strip amplifiers (re-aligned apartment house booster amplifiers) and an automatic level control strip. The coaxial cables were flexible, braided, half-inch and quarter-inch military RG types. For the long trunk run, they used the low-loss K-14 cable, more than an inch in diameter, and very stiff and hard to handle. They had preamplifiers for each channel, installed at the top of the 400-foot tower, to improve "snowy pictures" by increasing the signal-to-noise ratio.

It frequently became necessary for someone to climb to the top of the tower to replace vacuum tubes in the preamplifiers. Conroy said, "One time, in a very foolhardy frame of mind, I did climb that 400-foot tower—from the inside. I tell you, I'm glad I did, because I got an insight into what it was like to have to work up on top of that tower. You physically have to pull yourself up with your arms, because the tower frames are about three and a half feet apart. ... I learned what the technicians had to do, not only to get up there, but to rest after they get up, and then do their work."

Negotiations for permission to attach cable and other equipment to electric power and telephone pole lines were not difficult. The agreement called for annual payments of $1.50 per pole, with the usual bonding and liability insurance protections. The electric company agreement had no restrictions, although the Southwestern Bell agreement included a clause that seemed innocuous enough at the time. Conroy explained. "[It] provided that the contract was basically designed to facilitate use of off-air signals." In hindsight, it is clear that Southwestern Bell was looking to the future. He said, "In later years, when I was negotiating with telephone people, I heard them say more than once, 'We wish we had

never given the first pole-line contract.' But they did have that kind of language in there."

Southwestern Bell apparently had a bad experience with a Midwest Video system down in Victoria, Texas. This was before Uvalde was started, but the Victoria system operators had apparently done a bad job and antagonized the telephone company. George Pomeroy, district engineer for Southwestern Bell, let Conroy know in no uncertain terms that, "We're not going to have any of that goddamn stuff that you people put in down in Victoria. You're going to have a model plant here." When it was all over, Conroy became very friendly with Pomeroy and said, "George, you were certainly on my [tail] in those early days, but I think we did put in a good system." And Pomeroy responded, "You have a model plant here."

Part of the process of building a Cable TV system is the pole-by-pole survey to determine how to make the attachment to each pole in such a way as to comply with relevant safety codes (called "make-ready"). Coaxial cable and equipment must have proper clearance above ground, streets, and walkways; specified separation from existing communications lines and electric supply lines; and appropriate guying for mechanical security. Conroy said:

> *You'd check pole by pole with a power company engineer and a telephone company engineer. A lot of the poles were shared jointly by telephone and power. Power was always on top—they had the taller poles. If the phone company was the only one on the pole, it would tend to be a short one, thirty foot or even twenty-five foot. After going through these with the telephone company engineer—I was the one doing this because Faber was doing other things—the engineer would say, "That pole's got to be changed out." And that's where our pole-line rearrangement costs would come in. He would say, "We can lower our phone cable there." And that would be a cost. When I'd go out with the power company, we might hit a pole that had all kinds of crap on it—the transformers and everything else. It was on a corner and had two sets of primaries and secondary and they'd say, "We've got to change that one now." I'd think to myself, "Oh dammit, there goes $300 right there." And I'd say, "Well, can't you do it this way?" They would say, "Not with that bank of transformers there." So, that would have to be changed. ... So, I learned the system that way. That system I really knew because I had been out doing it, and I knew where the trouble places were.*

OPERATIONS, MARKETING, FINANCE

Besides Faber Spires, Conroy had two employees whose duties were to maintain the system, balance the amplifiers when needed, go out on trouble calls, and make hookups. Conroy said, "I've made a few drops—hookups. I've never made it from the pole, though. I was never a pole climber. ... I used to make them with Faber. I was a *grunt*. That is, Faber would climb the pole and I would be down below, or I'd go in the house, skin the cable back, and get the transformer ready."

It was difficult to keep the men on a forty-hour week. Conroy said "In fact, there was a lot of overtime because, if we had a problem at night, we went out [to fix it]." Even on Saturdays, when a customer said, "Well, I want it today. Can we get it?" Conroy said, "We'd go out and we'd do it that day."

As to marketing, Conroy said:

> *We didn't have a staff. I was the staff. In those days in a small system, you were the manager and you were the PR guy with the customers. I used to make up the ads and bring them around to the newspapers, and I learned how to do it pretty well. I also went door-to-door. One of the first things I did was to take a yellow pad and go around and note the address of all the antennas in town, because they represented my immediate, potential customers right there. [I never] got into the retail business, because the people I wanted to be on my side and help me sell cable were the dealers. I didn't want to compete with them. ... I told them that I am not in the TV set business. You are. I'm here to help you sell TV sets. I arranged tie-in promotions with the dealers. If they would sell the set and sell cable with it, I would give them a kickback, $10 or something like that. ... But no, I did not want to sell TVs. I had enough problems with cable and maintaining the people's good will.*

Jerrold estimated that an investment of $70,000 would be required to build the distribution plant. This was based on their typical cost experience of $2,000 to $3,000 per average plant mile. Unfortunately, they estimated the plant mileage based on experience in Pennsylvania towns, with densities of 100 to 135 homes per mile. But the West Texas towns were more likely to have densities of 50 to 70 homes per mile. Jerrold figured that Conroy would need twice as many miles of plant to cover all of Uvalde. Bill Miller, head of Jerrold's community operations division, wrote a letter saying, "Well, yes, this is our fault here. We applied figures for eastern towns and did not take into consideration what exists out there."

The agreement with Jerrold required Conroy to put up $70,000, and, if needed, another $14,000. Eventually, Conroy and his father bought Jerrold out of the Uvalde system. "Actually," Conroy said, "we didn't buy them out; they just went out. We ended up owing Jerrold; we owed them on equipment; we owed them on cable; and we didn't have the money to pay for any of it. So, we were in the hole. ... We owed Jerrold about $35,000. ... But at that time—1957 to 1958—Jerrold needed cash. They had some other things going, and they were in a cash bind. ... My father went down to see Milt Shapp and made a deal where I think he paid him some $30,000. It was just money we owed for their equipment. In return, we got the 49 percent back. Basically, we paid what we owed and we got the 49 percent. We ended up sole owners."

Ben Conroy's father, although retired, was still busy with his banking business. Conroy depended on his father, not only for financial support but also for advice. He said, "I knew more about the technical part of the business, but in terms of the balance sheets and all of that, he knew much more than I. I've caught

up with it, but then I was a real neophyte. In fact, when I went to Uvalde, I enrolled in the Southwest Texas Junior College. I took some courses in accounting so I could understand what the businessmen were talking about. I also took some Spanish, so I could understand what people were saying."

Ben Conroy was a Yankee, and, coming from Vermont, he certainly did not sound like a Texan. He began hearing himself referred to as "That Yankee." One of his first acquaintances was the man from whom he rented the land for his antenna site. Conroy said, "A dear friend, gone now, Farrel Warren... He was a real old-time Texan who had been a rancher. He actually took me in hand and showed me around town. He introduced me to the mayor. He was my first very good friend." Through his friend, Conroy met the newspaper editor and "some of whatever would pass for movers and shakers."

Still a bachelor, he dated some of their daughters. Once, he was invited to a party where a "snipe hunt" was set for the Yankee. Conroy knew about going out after dark into a pasture with a flashlight and holding a sack for the snipe to run into. But he thought, "Well, let them have some fun." He turned up at the ranch house and said, "Well, none of these things seemed to come along, so I thought I had just better get back here." There was a big story in the newspaper, with a picture of Conroy holding the sack.

One thing he enjoyed was visiting with John Nance Garner, former speaker of the House of Representatives and vice president of the United States, under Franklin Delano Roosevelt for two terms. "We'd go over to Garner's about 5 PM some days. ... He'd break his bottle of Jack Daniels out of the icebox and say, 'Well, let's strike a blow for liberty!' And we'd chat. He'd talk some about the older days, and he'd want to know when this cable was going to get in here. When it finally got in, he was one of my first customers."

One day, the construction crew was setting a pole anchor at the corner where a fellow named Asher lived and broke through his sewer line. He was a big guy, who raised and trained horses, and he came storming into the cable office shouting, "Your goddamn people have flooded my house!" So Conroy went out and looked it over with him and said, "We sure made a mess didn't we?" Of course, it was the construction crew's fault, so Conroy said, "Let's get the sewer line repaired and we'll pay for it. I'm sorry about all this." He later got to be good friends with Asher.

An unusual hazard was encountered when buzzards began roosting on the antennas on top of the tower. Buzzards are big old birds, and their weight was enough to damage the antenna elements. Spires came up with the idea of piping sound up the tower to scare the buzzards away. So they mounted an old all-weather type Navy loudspeaker on the tower, ran some audio wire up the tower, and connected it to the Channel 12 audio. This was their third channel, an ABC affiliate, which came on the air about 1957. The newspaper reported that Channel 12 was scaring off the buzzards: "Antennas aren't for the birds!" Conroy said, "I sent a copy

of this to Channel 12, and I'll be damned if it didn't go out on an AP newswire: 'Channel 12 sound scaring off the buzzards!' "

Conroy started out with a connection charge of $125 and $4 monthly service charge. With the 8 percent excise tax added, the subscriber paid $135 for the hookup and $4.32 for monthly service. Although, in 1958, the U.S. Court of Appeals ruled that the excise tax did not apply to Cable TV, Conroy soon recognized that even the $125 hookup fee was a serious barrier. So he introduced a rate schedule with a $10 hookup charge and $8.95 monthly fee. But a lot of people thought $8.95 was too high. So he went to $30 hookup and $5.95 monthly. Conroy said, "We had the damnedest, screwiest rate structure that you've ever seen!"

The first year, they connected 300 subscribers. Conroy said, "This was not a quick sell. ... Promotion was a constant thing. ... Anything to get people in. ... People were not flocking to the door, by any means. ... Some promotions were original; some came from Jerrold; and some came from the NCTA. ... Toys at Christmas for Kiwanis. ... Free service for bringing in a friend. ... We had to use all kinds of screwy promotions. ... We had to persuade people, entice them. We had to take antennas in trade, and I didn't want those damn antennas!" Penetration in the Latino areas was very slow. Conroy said, "I remember trying to get the Mexican-Americans to hook on. We ran a chicken promotion, one time, because they all raised chickens in their backyards." He ran an ad in the newspaper saying, "You bring in your chicken, all dressed, and we'll allow you so much a connection for that." A big box full of chickens was donated to some charity. But, according to Conroy, "We didn't really crack the Mexican-American market until we were able to bring in Channel 41 from San Antonio in 1960–1961. That is a Spanish language channel."

In the late 1950s, Jerrold's Bill Miller invited Conroy to represent the company in the border counties along the Rio Grande, between El Paso, Del Rio, and Eagle Pass. After the Uvalde system became profitable and took less of his time, Conroy spent two or three years traveling, visiting systems in the region, and selling equipment for commissions. Jerrold paid his expenses, and, although he did sell some equipment, he didn't make much money at it. But he said, "I got to see quite a bit of the country and met a lot of the people. I became a little better known than had I just stayed in Uvalde. That led to other things, in terms of state association work and so forth."

Expansion and Collaboration

A couple of months after Conroy opened the first section of his system in Uvalde, Jack Crosby began connecting customers to the system he was starting in Del Rio, on the Mexican border about 70 miles west of Uvalde and 160 miles from San Antonio. Reception of San Antonio television signals was terrible. It was so bad, in fact, that Crosby had to do something. Conroy said, "He was over in Uvalde a lot, and I would go out with him. We would go east to some of the hills around Uvalde with a Jerrold engineer [Caywood Cooley] and look at signals with a view

to microwaving TV signals from Uvalde to Del Rio. ... We went out with small antennas, a tent, a small TV set, a field strength meter, and a power generator. We'd spend whole afternoons out there. Caywood christened the hill we were on Jim Beam Hill, because I would bring a bottle of Jim Beam and a container of water. We'd sip on that and look at pictures and take notes. [Caywood] was there for nearly a week, at one time."

Jack Crosby then established Southwest Texas Transmission Company as a microwave common carrier to bring the San Antonio TV signals from Uvalde to Del Rio. He put his microwave antenna and equipment at Conroy's headend, sharing expenses, including the cost of a taller tower. Conroy said, "So he was getting pictures at least as good as we got in Uvalde. Ours weren't always that good, because we would still get co-channel interference."

Conroy's Uvalde system finally became profitable around 1959 or 1960. At about that time, after Jerrold had dropped out, Conroy and his father reorganized the enterprise, which had been essentially a family-type operation. Conroy ended up with 51 percent, while his father, brother, and sister became the remaining shareholders. Conroy said, "My father knew I was interested in expanding. We talked about using Uvalde as a basis for establishing other things. We were beginning to get offers from different people, including Jack Crosby. He wanted to buy the system. He was always after me for that. I really wanted to go out and do it on my own, but I felt a little inhibited in the sense that we still had this as a family system."

Effingham, Illinois

One day in 1961, Harry Hornby, editor of the Uvalde newspaper, called Conroy and said, "Come on over here. There's a fellow here from Illinois who can't get TV." And Conroy said, "Harry, there's lots of people up there who can't get TV!" Hornby said, "Just come on over." The man was from Altamont, Illinois, a dozen miles east of Effingham, a town of 10,000 or 11,000 population. Effingham is located on I-70, some ninety-five miles east of St. Louis, Missouri, and seventy miles west of Terre Haute, Indiana, and about sixty-five miles from Champaign, Illinois. Conroy thought, "God! They have signals all around them, but they're far enough away." There were some cable systems in northern Illinois, but none in this central part of the state.

Conroy and Crosby were both members of the NCTA Board of Directors in 1961. Conroy said, "I made a lot of my long-lasting friends from when I served on that board." At a scheduled NCTA Board meeting in Chicago, Conroy suggested to Crosby, "Let's take a car when this is done and drive down to Effingham to see if we ought to get interested, just see what it looks like." So they drove the 200 miles or so to Effingham, visited with various people suggested by the man with whom Conroy had talked at the Uvalde newspaper office, and took a look at television pictures displayed in appliance stores. They found that, although the folks in Effingham could get a lot of broadcast signals, the pictures were pretty terrible. Maybe there is something to this.

They met the mayor and indicated they would like to apply for a franchise to build a cable system in Effingham. When he received the proposal with a sample franchise agreement, the mayor asked people he met on the street, "What do you think we ought to do?" When Conroy learned that the mayor had talked to a man named Hays, who ran the local theater, he was furious. Although the Television Accessory Manufacturers Institute, known as TAME (sic) was not yet organized, motion picture theater owners were already vigorously protesting Cable TV franchises as threats to their very existence.[2]

Still fuming as he was being interviewed for his Oral History, Conroy said, "God damn! I don't know how to describe this man Hays." It seems Hays had been trying to get Frasina Theaters to build a Cable TV system in Effingham, but the owners were not interested. So Hays filed the proposal for franchise on behalf of his own company. Conroy said, "We came to one of these franchise battles, and Hays—damn his soul!—raised the ante to 5 percent [of gross revenue] for the franchise fee. We had talked about 2 percent and that was that." In the end, the council awarded two franchises. Conroy said, "Our problem was compounded because neither the electric power company nor the telephone company would even talk to us about a pole-line contract."

On one of their trips to Effingham, Conroy and Crosby agreed that "two systems [in Effingham] was for the birds." So Crosby suggested they try to work something out. Frasina Theaters operated a chain of motion picture theaters, based in Springfield. "The owners were Italians, very fine gentlemen," said Conroy. So they went up to Springfield and walked into the Frasina Theater offices cold. As it happened, they were having a board meeting. One fellow looked up and said, "Ah! The boys from Texas! Why are you giving us so much trouble?" To make a long story short, Conroy said, "We ended up forming a partnership, but they insisted that Hays be the manager. He was their man, and we said, 'All right.' But we didn't like him."

They did get the system into operation, in 1962. Instead of Jerrold equipment, however, they used some of the equipment being built by Fred Lieberman, a former Jerrold employee. And since they could not get an agreement to use existing utility poles, they had to set their own twenty-five foot, Class 5 poles, throughout the community. Conroy said, "We used the power company engineering. We just followed along and set our poles right alongside the power company's. They would object, and we said, 'Up your ass, buddy! You won't give us a contract. We're setting poles. We got the right, and it will be cheaper for us in the long run.' I think it cost us between $15 and $20 per pole." Since the rates set for other cable system operators in that area were about $5 a year, they could break even on pole rentals in three or four years. Following Conroy's experience in Uvalde, they set the rate structure at $20-$25 to hook up and $6.95 a month service fee. Conroy said, "We got into the black much more rapidly than I had in Uvalde."

Ben Conroy and Jack Crosby first tried to borrow from their own banks the $125,000 that they would need to build the system. Crosby had apparently used

up all his credit in Del Rio, so Conroy went to his bank in Uvalde. Conroy said, "After [presenting our case] and leaving the bank, I glanced down at my feet and discovered that I had on one brown shoe and one black shoe! Apparently, I had gone home for lunch and, before coming back to meet Jack, had followed my usual custom of taking a twenty-minute nap and had put on one wrong shoe! Well, we did not get the loan there at the Uvalde bank. I'll never know what part my mismatched shoes played in the Uvalde bank's decision. I think they really felt that Effingham, Illinois, was a little bit out of their territory and declined on those grounds."

So they drove up to Indianapolis to talk to Economy Finance about financing their project. Economy Finance was primarily a home finance company, but it also made consumer loans, and Jim Ackerman, economy finance officer, was already trying to get the company into Cable TV financing. Economy was willing to make the loan but would require personal guarantees. Conroy said, "Well, that was fine. I could make the guarantee, but if push came to shove, I didn't have the money to pay it off. But I guaranteed it anyway." So, the loan was made, at a 6 percent "add-on" rate, for five years. Conroy said, "Effectively, that's about 11 percent. We thought, God! That's high as a kite! But at that time no one was lending money to cable. So, what the hell, we'll just go with that 6 percent."

They had to arrange interim financing, perhaps through their local banks, until the system was completed and the Economy Finance loan began. As Conroy said, "With add-on [interest], if [the loan] were $120,000 [for five years], they would add on the amount of the interest [five years at 6 percent], and it would be a $156,000 loan. That's the add-on business." In addition, Economy Finance required Conroy and Crosby to put another $15,000 equity into the system in order to maintain the necessary cash flow for repayments on the loan. Conroy said, "We paid the thing out on time. In fact, we even had to borrow a little bit more when we extended into a neighboring town. But we paid it out right on time. That thing came along much faster than Uvalde."

Cotulla, Texas

Cotulla is a little town with about 3,600 population on I-35, some ninety or more miles south of San Antonio and about sixty miles north of Laredo. More than half of the Cotulla population was Spanish speaking. Ed Leonard, former manager of the Vumore system in Laredo, got a franchise for Cable TV in Cotulla and came to Conroy suggesting a 50/50 partnership to build and operate the system. Conroy said, "Just as a friendly gesture, I brought in some of my Uvalde friends. We all put up some money." They put up the usual 400-foot tower and were able to receive the Spanish-language Channel 41 from San Antonio. Growth was slow, but it eventually became profitable. Conroy said, "We never got more than 1,000 customers, which was 95 percent of the homes. We turned ourselves into a sub-chapter S corporation, paid off all our loans, and operated it for a number of years just making quarterly dividends. We all made a little money on it. Eventually, we sold it in 1979."

Rumford, Maine

As chairman of the NCTA Pole Line Committee, Conroy heard about an operator who was trying to build a Cable TV system in Rumford, Maine, but was refused a pole attachment agreement. The telephone company said, "We'll only lease you a system. We will build it and lease it back to you." However, the operator proceeded to build the system, setting his own poles where there were no available electric power poles. "Then," according to Conroy, "someone else came along and [started a second] system on the lease-back basis." With two systems running in Rumford, it was not a good situation. Conroy said, "Through my work on the Pole Line Committee and the NCTA, we kept hearing ... about what this damn phone company was doing in order to drive this other guy [with his own poles] out of business. I often used to laugh that we [Crosby, Conroy, and two others] resolved this problem just by laying money on the table and buying out the phone company [lease-back plant]." Then, Conroy and his associates bought the other system, combined them, and began operating them as a single system. He admitted, "I'd hate to solve every problem we had by doing that, but it eventually became profitable."

GenCoE

By 1965, Jack Crosby had formed an alliance with Fred Lieberman in Telesystems Corporation, the company Lieberman had formed, not only to build and acquire systems, but also to build and sell equipment for Cable TV. Conroy said, "I think Jack might have owned 25 percent, or something like that. ... He soon wanted to parlay his interests in Del Rio and expand into other systems. ... Jack had been after me, wanting to buy Uvalde. He made various offers from time to time, and other people were coming to buy. I remember even Frank Thompson visited my system in 1965." Before the 1965 and 1966 NCTA conventions, Ben Conroy and Jack Crosby, along with Glenn Flinn (Tyler, Texas) and Gene Schneider (See Chapter 10), began talking seriously about the idea of joining forces. Conroy said, "We put together a plan whereby we would form a holding company which would continue to operate our systems. [Each] system would, essentially, keep [its own] corporate character. Therefore ... we felt we wouldn't have to go back to our city councils because the basic corporate ownership had only been expanded. We still had the same people in them." This was formally launched in 1966 as General Communication and Entertainment, to be known by the acronym GenCoE, with W.D. "Bill" Arnold as treasurer.

Meanwhile, Crosby and Lieberman had acquired the West Texas microwave and Cable TV systems in Abilene and Sweetwater, Texas, which were included in the GenCoE holdings. The two systems were financed by Texas Capital Corporation, a Small Business Investment Company located in Georgetown, thirty miles north of Austin. Bob Hughes was an account executive for Texas Capital. The group of systems that Schneider brought to GenCoE was known as Wentronics

(Western Electronics) and included not only Casper, Wyoming, but also systems in Maryland, New Mexico, and Utah. Bud Nelson and his father owned systems in Peru and LaSalle, Illinois, that were brought into the holding company. Texas Capital itself would not finance the GenCoE acquisition program. However, Bob Hughes, working with Texas Capital, helped GenCoE get financing from Home Life Insurance Company and arranged an association with the Bank of the Commonwealth in Detroit.

Through an old college roommate, Jack Crosby began talking with Wayne Swearingen, president of Livingston Oil Corporation, a small, secondary-recovery oil company in Tulsa, Oklahoma. Conroy explained, "They would go into [an oil] well that had worked, initially. Then they used water flooding to push the oil up." Livingston, which was listed on the New York Stock Exchange with the symbol LVO, wanted to expand into other fields. Gene Schneider said, "In early 1968, we decided to merge GenCoE with Livingston Oil, which made GenCoE the largest stockholder in Livingston Oil. As I recall, we were right at 37 to 40 percent of the company as a result of that merger."[3] Crosby became chairman of the board. Conroy and the Schneider brothers were added to the board that was elected before the merger. Gene Schneider said, "The original founder of Livingston had essentially sold out, so I think they had around 20,000 stockholders, and I don't think a single one of them owned over 1 or 2 percent."

However, at the very first meeting, the GenCoE people found themselves in sharp disagreement with the carryover board members, who were not much interested in Cable TV. Schneider preferred to use GenCoE's dominant shareholder position to elect a new board in a proxy campaign. However, Crosby and Conroy were not comfortable with such tactics and arranged to buy back their systems at Del Rio and Uvalde, leaving the Schneiders in control at Livingston Oil.

COMMUNICATIONS PROPERTIES INC.

After leaving GenCoE behind with Livingston Oil, Conroy and Crosby went over to Kerrville, some sixty miles northwest of San Antonio on I-10. Kerrville is about the size of Uvalde but with a smaller Spanish-speaking population. Mr. Brances, the owner of the Kerrville system, was interested in selling. In order to finance the buyback of their Uvalde and Del Rio systems as well as the acquisition of the Kerrville system, Communications Properties Inc. (CPI) was organized. Ben Conroy, Jack Crosby, Bill Arnold, and Bob Hughes were the founders of the company, originally called Communications Inc. They went public with about 11,000 to 12,000 customers in the three systems. Crosby was primarily involved in finding other deals. Hughes, who left Texas Capital to come to CPI, was mainly responsible for finding the money. Arnold, as treasurer, kept track of the money. Conroy was the operator who ran the systems. Crosby was also involved in another group of three little systems west of Dallas—Ranger, Cisco, and Eastland—which may have had 3,000 customers, managed by Glen Scallorn. CPI purchased these systems for stock, in order

to establish credibility and a basis for stock acquisitions. With the publicly held stock and some debentures, CPI intended to make acquisitions.

In the late 1960s and early 1970s, Claude Stevanus, of Sugarcreek, Ohio (see Chapter 11), served as a member of the NCTA Board of Directors, where he became well acquainted with Conroy and Crosby. In 1967, Stevanus had reorganized his company, Tower Communications Inc., as a wholly owned subsidiary of Citizens Financial Corporation of Cleveland, a publicly owned company. At the 1969 NCTA convention in San Francisco, Stevanus introduced Dick Johnston, a Tower Communications director and principal of Citizens Finance Corporation, to Conroy and Crosby. They talked about the possibility of CPI acquiring Tower Communications. In 1971, the deal was completed with an exchange of stock. Conroy said, "They had a lot more systems [and customers] than we did and had their own computer system. So, we were gradually building things up."

Then Fred Lieberman's Telesystems group came in, with a system in operation in part of Philadelphia and more franchises in the Philadelphia area. Telesystems also had large systems in Lafayette, Indiana, and Williamsport, Pennsylvania, and was in the process of building systems in Meriden and Hartford, Connecticut. CPI entered the franchise battles and won Louisville, Kentucky, and Little Rock, Arkansas. In the early 1970s, CPI bought Springfield, Illinois. "By 1979," according to Conroy, "we had probably 330,000 to 340,000 customers."

Conroy said, "Bob Hughes was the money man, and we dealt with lots of banks. Initially, it was with Fidelity in Philadelphia, and then Pittsburgh National Bank became our lead bank. But we were also involved with Chase in New York, a bank in Cleveland, Home Life, and Aetna. All of these, particularly the insurance companies, would get either stock or warrants on the stocks so that, in essence, they not only lent the money, but they got some equity.

"You know," he said, "the cable industry fell into pretty hard times in the early and middle 1970s. ... We were still operating under the 1972 FCC rules, and deregulation hadn't begun." Then, a couple of the banks told Hughes, "We're going to call your loan. We want it paid off." But CPI didn't have the money. So, according to Conroy, Hughes threw a set of keys on the table and said, "OK, there are the keys to our system. You take them." And he walked away. Conroy said, "Well, that's not what they wanted, so they kept on with us. Bob is a gutsy little guy! He was the one who worked with all these people. I was always glad not to. One, I'm not that well oriented in finance. I'm more into operations and even engineering, if you will. But Bob is very good at finance."

By about 1978, Lieberman wanted to sell out and was talking to several potential buyers. In April 1979, Times Mirror bought CPI. According to Conroy, Times Mirror paid cash for the stock and assumed $80 to $85 million in debt.

Conroy said, "I must confess that, at the time, I didn't think the price was very good. I think the price was $17 [per share]. United Cable and CPI had been tracking each other in share prices, and before long they were up to $24. I don't think Bob Hughes thought the price was very good either. But, our biggest single

shareholder, Fred Lieberman, wanted out. So, the 800-pound gorilla sat down where he wanted to. ... With that, CPI came to an end as an operating entity. A lot of our people moved out to California. ... I declined to move. I had no interest whatsoever in being in California with Times Mirror. I don't think they had a place for me." When Ralph Swett, president of Times Mirror Cable, said, "Well, we've got everybody settled, so what's Ben Conroy going to do?" Conroy replied, knowing that Toni and the kids didn't want to go to California either, "Ben Conroy is going to stay right here." Then he said, "I could see his sigh of relief."

BESIEGED WITH ADVERSARIES

Conroy was elected to the NCTA Board of Directors in 1961; Crosby in 1960. Conroy succeeded Frank Thompson as secretary in 1963 and was elected chairman of the board in 1965. In the 1970s, Conroy was elected to a second three-year term as director. One of his first assignments as a director was the appointment by then-Chairman Glenn Flinn to succeed Milt Shapp as chairman of the Pole Line Attachment Committee, renamed in 1965 as the Utility Relations Committee. From the time he was first appointed, Conroy served continuously as chairman of the Utilities Relations Committee until he finally left the board and turned over the committee responsibilities to Amos "Bud" Hostetter. From his vantage point as an officer of the NCTA, Conroy was often close to the center of the attacks and controversies with which the Cable TV industry was besieged for most of its short history. Much of it has been captured in his Oral History.

Broadcasters—Copyright

As Conroy saw it, "The basic feeling of the broadcasters was that cable people were pirates! [They believed that] we were taking advantage of other people's efforts and not paying them adequately, not compensating them for their efforts." The broadcasters' long-seething anger finally erupted in major litigation in June 1960. United Artists Television filed an action in Federal District Court, *United Artists Television Inc. v. Fortnightly Corporation*, alleging copyright infringement (see Chapters 2 and 3). Conroy said, "Our argument, on which we ultimately prevailed, was that we were not a program service. We were a master antenna that did not change or, in any other way, alter the signals. ... Taking the advice of our attorneys, we were probably ultra-careful, in those days, not to mar what we called the simon-pure image of community antenna television."

In 1960, with his customary dramatic showmanship, Irving Kahn, president of TelePrompTer, introduced what he called "Key-TV," accessed by means of a key instead of coins in the slot. This was clearly Pay-TV, a program origination service that was not broadcast over the air, contrary to the industry's legal posture. Conroy said, "A lot of our people were shaken, if not horrified. ... We didn't want to be associated with a program service. ... As time went on, even while the suit was pending, it was easy to see that cable was going to have many more uses than just being a retransmission service, particularly in closed-circuit television, and even showing

movies. A movie experiment had [already] been done in Bartlesville, Oklahoma. ... Nevertheless, we wanted to keep the image of a master antenna service, even to the extent of [protecting] the name of the National *Community* Television Association."

Conroy was the outgoing chairman at the 1966 NCTA convention at the Fontainbleu Hotel in Miami Beach. During the business meeting, Bill Daniels proposed from the floor that the name of the association be changed to National *Cable* Television Association in order to better reflect the actual business in which its members were engaged. Conroy said, "Bill Daniels was always one of the more forward looking thinkers of the industry." There was considerable spirited discussion. Conroy looked over at Strat Smith, NCTA legal counsel, who said, "I came very close to saying nothing at all. I was tired of the reputation I was getting for resisting industry progress. ... When I did ask for the floor, I did not speak for long. In essence what I said was that, from the beginning, they had heard me tell them time and again that the only likely defense against copyright liability was that Cable TV was an antenna service and that this was a pretty silly time [with the *Fortnightly* case still pending] to abandon the concept. I recall telling them that it could easily lose the case for them. And the Supreme Court acceptance of the concept suggests that I may well have been right."[4] No one else spoke a word. After relinquishing the chair, Conroy moved to table Daniels' motion. Without a single nay vote, not even from Daniels, the name change was tabled. Conroy said, "I think Bill Daniels was a little put off by it. When he presented me with an award later that evening, he said with a smile, 'You almost blew it this afternoon.' "

The issue of the name change was reintroduced and adopted at the 1967 convention in Chicago. Although the Federal District Court had already ruled adversely in 1966, and the name change would probably have minimal effect on the appeal, Strat Smith would still have preferred further delay. Yet, recognizing that the industry was changing, and that many operators were restless under the constraints of the "master antenna" legal posture, Smith was resigned to the inevitable. This time, the motion passed, and NCTA officially became the National Cable Television Association.

A year later, in June 1968, after eight long years of litigation as the case received adverse rulings in both the District Court and the Appeals Court, the industry won final vindication when the U.S. Supreme Court overturned the lower court rulings. The court held that the cable television system was a passive conduit, a "master receiving antenna," whose services did not constitute infringement of copyright.

Broadcasters—Unfair Competition and Economic Injury

At first, broadcasters were focused on unfair competition and economic injury. They complained that Cable TV was delivering programs to its customers without FCC authorization, in direct competition with licensed broadcast services. They argued that Cable TV was trespassing on the service areas allotted to television broadcasters in the FCC Sixth Report and Order. They argued that loss of viewers

would adversely affect their advertising revenue, forcing them into bankruptcy. "Free television" would be destroyed, and coverage of local news, issues, and events would be denied. Some broadcasters complained, without factual evidence, that Cable TV operators refused to carry the local station signals or even deliberately degraded the programs of the local stations in favor of signals from out of town.

Initially, the most passionate and emotional attacks on Cable TV came from small-market broadcasters, mostly from the far West. They urged their congressmen to "protect free broadcasting" and unceasingly nagged the FCC to take jurisdiction over Cable TV. As Conroy said, "While the broadcasters liked having their signals broadcast to other communities, particularly by microwave, they weren't enamored about having other broadcast signals brought into their communities. They did everything they could to put obstacles in the way of Cable TV."

Broadcaster antipathy toward cable operators was palpable, as seen in an incident about 1961, shortly after the formation of the Texas Cable Television Association. Conroy said, "John Mankin [secretary-treasurer] got a letter from Bonner McLaine, executive director of the Texas Association of Broadcasters, [inviting] our new association to join the Texas Association of Broadcasters as an associate member. Our representatives were invited to attend their upcoming meeting in Austin. Jack Crosby, John Mankin, and I attended. We visited around, attended sessions, and greeted people, as you would generally do at conventions. Once our presence became known, there was a noticeable chill in the initially cordial atmosphere—particularly Marshall Pengra of Tyler, Vann Kennedy of Corpus Christi, and a few others who were notably anti-cable. It was an embarrassed Bonner McLaine who later had to un-invite us from the Broadcasters Association."

On another occasion, in the early 1970s, a bill in the Texas Senate would have put Cable TV under Public Utility Commission jurisdiction. Conroy presented testimony before the State Affairs Committee of the Senate. Senator Mike McKinnon, general manager of the Corpus Christi, Channel 3, television broadcasting station was a member of the committee. Conroy said, "After responding to [Senator McKinnon's] hostile questioning for a while, I suggested that his presence at this hearing was, in my opinion, a direct conflict of interest because of his broadcasting business in Corpus Christi. I could hear my lawyer-lobbyist at my side kind of gasp." The senator made all sorts of objections, "You're out of order!" However, Conroy reported, "The bill never did get out of committee."

After the passage of time, relations between broadcasters and Cable TV people can best be described as friendly but distant. Emotional issues have been mostly resolved, although not to everyone's satisfaction. Many broadcasters have become cable operators. But the initial antipathies have not been entirely buried.

Telephone and Electric Power Utilities

Over a period of some fifteen years, Conroy became a knowledgeable and effective representative of the Cable TV industry with respect to pole-line attachments and utility relations. From the beginning, the telephone companies resented the

cable television industry as usurpers in the field of communications in which they had staked an exclusive claim. Initially, the electric power companies welcomed the additional load represented by ubiquitous television receivers as well as the equipment required for coaxial cable networks.

The practice of attaching electric supply lines and communication lines to the same poles was well established, to avoid both the cost and unsightliness of placing duplicate poles. Since each company paid rent on roughly half the poles and received rent on the other half, the fees for leasing became unimportant—a wash. The situation changed materially when a third party, the coaxial television lines, entered the picture.

Probably sometime in 1958, Milt Shapp designated Conroy as coordinator for the Southwest region of the country, to collect information from Cable TV operators on problems they were having with the telephone companies. A meeting was held in April 1959 that resulted in the formation of a Pole Line Attachment Committee, with Shapp as chairman, succeeded by Conroy in 1961. Conroy said, "The complaints of the operators were (1) increased rates; (2) restrictions being imposed, particularly on new systems; (3) unrealistic [financial] bonding requirements; (4) unrealistic insurance requirements; and (5) very unrealistic make-ready charges (i.e., preparing the poles to accommodate cable)."

Pole attachment rates at first were typically $1.50 per attachment per year. When these began to climb to $3.00, then $5.00, and even as high as $7.00, Conroy said to the telephone companies, "Somehow, this has got to be based on cost. It can't be based on what you think your pole is worth. It's got to be based on cost." Frank Drendel, now chairman of CommScope, began his career with Continental Telephone Company. Conroy said, "He had a fountain of knowledge of telephone company economics and embedded debt and all of that." With Drendel's help, using some materials that Southwestern Bell had presented to justify its costs, Conroy devised a formula for pole attachment fees, based on costs. "Basically," he said, "it was a combination of (A) the net book cost installed; (B) the annual cost of maintaining the poles; and (C) the percentage of usable space occupied by cable. So {A+B}×C = pole attachment rate." Jay Ricks referred to this as the Conroy Plan. But Conroy said, "It wasn't. It was stuff that I had distilled from mostly telephone company presentations and figures, and I'd adapted it to our use." Ultimately, this was enacted into law and successfully defended in the U.S. Supreme Court.

In the meantime, telephone companies adopted another strategy, which they called "channel transmission service," more commonly referred to as "lease-back." They would build a distribution plant to transmit specific channels from the headend to customer taps. The operator was responsible for building and maintaining the headend and for installing and servicing customer drops. A bond was generally required equivalent to the total cost of the plant, amortized over the term of the lease so that the telephone company recovered its capital costs while retaining ownership of the plant. Conroy said, "In addition, they had a bunch of charges: so much for tapping into a feeder line to hook up a customer; so much

per customer per month; and so forth. This was in addition to the monthly quarter-mile charges for the plant. Their charges were ferociously high! ... In some of the later lease-back proposals, the telephone company ... built the plant at our expense and then appropriated a certain amount of bandwidth for themselves, for whatever purposes."

The people who took advantage of the channel transmission service were people who knew little or nothing about the business, including some broadcasters. They thought this was an easy way to get into the business without much investment. Typically, even a franchise was not necessary. In some cases, General Telephone and United Telephone refused to grant pole attachment contracts, offering only the channel transmission service. Conroy said, "I think the telephone companies were making a grab at control of the industry. 'So if it goes over a wire, it's going to be a Bell wire.' ... Ultimately, it was decided at the FCC, under Section 214 of the Communications Act, that no telephone company could build such a lease-back system without going through the provisions of Section 214. You would have to get a permit from the Commission." Section 214 relates to extending communication lines, providing for public hearings on applications, and compliance with common carrier regulations. The lease-back arrangements did not conform with Section 214.

Translators

The "illegal boosters" (on-channel repeaters) apparently had little impact in Texas. However, Conroy and Crosby worried about the UHF translators authorized by the FCC about 1958. Conroy said, "We had a parade of translator people coming through town, talking it up with the television dealers. Some of them even set up demonstrations to show how great this idea was. They could provide no better signal than we, and, as a matter of fact, theirs wasn't as good. They didn't begin to have the height on the tower, and once we put in microwave, they couldn't begin to duplicate that. ... [According to FCC rules], you could not put a microwave signal on a translator. ... In the early days of translator activity, I was concerned about this, just as I was concerned about anything that might come along and pose a threat [to the industry]." Conroy put in several translators, as he said, "just to try to further block anyone else from coming in." He said, "I think the FCC was casting a fishy eye in my direction, thinking, 'Who does he think he's kidding?'... We were really, in all honesty, feeding the signal out to the jackrabbits." The translator activity soon collapsed, and Conroy said, "That was not a business that I was too happy to get into. I did it as a means of insurance and some degree of self-protection."

TAME—TV Dealers—Theater Operators

However, the burst of translator activity did stir up some resentment among TV dealers and repairmen. In 1963, TAME was organized to fight against 'indiscriminate' CATV system franchising."[5] Conroy said, "This was one of the many pressure

groups that were hostile to cable. ... These TAME people would make up the most scurrilous stories about cable, and the terrible thing it was, and what it would do to a town. But when you came right down to debating with them, their arguments just didn't stand up. I remember one time in Dallas. The NCTA had asked me to appear at this TAME meeting. I had already gotten a bunch of their literature and folders that I went through, one by one. This was a meeting of Texas TV service people. There were antenna manufacturers there." So Conroy just said to them, "This stuff is garbage. You can't back that up, and it just doesn't happen. This is just pure garbage. If you want to believe these people because their ox is being gored, it's going to be your problem."

Senate Bill S-2653

With all this opposition, Conroy said, "We just saw that we were up to our armpits in alligators, and we needed a way to get out of the swamp." So in 1959, NCTA began to draft its own legislation. Cable TV witnesses testified in support of "fair public interest regulation," but in opposition to "legislation designed to put them out of business." The NCTA draft was not acceptable to broadcasters, and a compromise bill—S-2653—drafted by the committee staff after hearings, was reported to the full U.S. Senate for vote in May 1960. The bill would have provided for licensing Cable TV under public interest standards comparable to those applied to broadcasting.

From the beginning, the industry had supported NCTA's efforts to craft acceptable legislation. For months, members had walked the corridors on Capitol Hill, urging their friends in the Senate to vote favorably on the compromise bill. Then, shortly before the scheduled voting, Milt Shapp and Henry Griffing sent urgent telegrams calling NCTA members to a special meeting in Washington, where they convinced many that the industry did not need and did not want to be regulated. Members went back up to the Hill to urge their senators to vote against the very bill for which they had so recently been lobbying. After acrimonious debate on the floor, the bill was sent back to the committee by a one-vote margin.

It is arguable whether the industry would have been better off in the long run with the passage of S-2653. Conroy said, "I was one of the troops that went up to the Hill and stormed the Senate. That bill was beaten by one vote. Although, in retrospect, looking at what came later on, that was a harmless little bill. But, at any rate, we beat it." Texas Senator Yarborough, who was believed to favor the bill, was absent and did not vote. When Conroy met with him later, the senator said, "You damn people! People that have been my supporters all my career. You've got them against me here." Conroy replied, "Well, you know, senator, it's my career, too."

"Senator Pastore [D-R.I.], before whose subcommittee the bill was heard, was irate," Conroy recalled, "because he felt he had been double-crossed. And it probably was so. You can't treat the Congress that way—agree to it and then switch. So, for a long time, the NCTA's name was anathema on the Hill. The association couldn't get anywhere. But anyway, we beat the bill. I remember going with Henry

Griffing and Larry Boggs to Senator Monroney's office [D-Okla.]. Monroney opened the door, and Henry Griffing said, 'You old son-of-a-bitch, we did it!' (Chuckle) Great rejoicing! But, it came back to haunt us."

OUR FRIENDS—OUR CUSTOMERS

In 1965-1966, Conroy was chairman of the NCTA Board. He said, "Everybody was hostile to us. Just count them. You had copyright people, the movie people, the network people, the stations, the telephone companies, gradually the power companies, and the antenna manufacturers. We had only one group of friends—our customers! ... They not only buttered our bread, they helped us with our political problems."

NOTES

1. *Benjamin J. Conroy Jr., An Oral History,* interview by Bob Dudley, May 1987 (Denver: The Cable Center).
2. *Television Digest,* New Series, vol. 3, no. 41 (October 14, 1963): p. 1.
3. *Gene Schneider, An Oral History,* interview by E. Stratford Smith, April 1991 (Denver: The Cable Center).
4. *E. Stratford Smith, An Oral History,* interview by Pat Parsons, March 1986 (Denver: The Cable Center).
5. *Television Digest*, op. cit.

CHAPTER 10

RICHARD AND GENE SCHNEIDER

Gene Schneider and his older brother, Richard, began their remarkable careers in cable television in Casper, Wyoming, in 1953. Working with a group of Casper oilmen led by Bill Daniels, they brought television into Wyoming for the first time. Denver TV signals were received off-the-air on the Colorado border and transmitted into Casper by microwave, using facilities leased from AT&T. Both Schneiders earned their BSEE degrees at the University of Texas. With Gene as the executive officer and Richard as chief engineer, their leadership progressed rapidly from Wentronics, through GenCoE, LVO Cable, United Cable Television, and United Artists Entertainment, to the present worldwide United International Holdings. Gene Schneider was a charter member of the Cable TV Pioneers and served on the NCTA Board of Directors. Richard died in March 1991, at the age of sixty-six. The Schneiders' story is told largely from Gene Schneider's Oral History interview by E. Stratford Smith in April 1991.[1]

PERSONAL HISTORY

The Schneider brothers were born in Enid, Oklahoma: Richard in March 1925, Gene in September 1926. Their grandfather emigrated from Germany. Their maternal ancestry was of Scotch-Irish-English descent, living in America for many generations. Their father and uncle were in the oil-well business, as drilling contractors. About 1930, during the Great Depression, they were forced to sell out, and the family moved to a farm in south Texas, near San Benito where the boys went to school. Immediately upon graduating from high school, they entered the University of Texas. Their studies were interrupted with a couple of years in the Navy, as aviation/radar technicians. After they were discharged from the Navy, they returned to the University of Texas. Richard graduated in 1948, Gene in 1949. Both received bachelor of science degrees in electrical engineering.

DANIELS SEES TELEVISION FOR THE FIRST TIME

The Schneiders were introduced to Cable Television in 1952 by Bill Daniels, a former fighter pilot and Golden Gloves boxing champion who became a pioneer leader in the new industry.

"After the Japanese surrendered in 1945," Daniels said, "I elected to get out of the Navy and return to Hobbs, New Mexico, where my father had built a fine insurance business, specializing in the oil industry. I joined him, knowing nothing about the business, but I learned rather quickly." Bill Daniels had a younger brother, Jack Daniels, "not a bad handle, easy to remember," he said. A year after Bill Daniels joined his father's firm, Jack Daniels came home from the Navy, where he had served on a small destroyer. But in August 1950, Bill was called back for the Korean conflict. He said, "I was out twenty-four months later." By that time, his brother had been running the office, and Bill said to him, "OK, I'm home. I'm ready to take the business over again. Move over!" Bill will never forget what his brother said: "Move over, my ass! You've been gone for two years!"[2]

So Bill Daniels, the flamboyant insurance broker, said, "I wanted to plow some new ground, so I looked for another town where there was a big oil boom, because my specialty was oil insurance, as my dad had taught me." Daniels drove all over the Rocky Mountain area and finally settled on Casper, Wyoming. He said, "At this time, I was thirty-two years old and had no college education—two years only. I had never had an accounting course—still haven't. I moved to Casper and did well in my insurance business." On his way from his home in Hobbs to set up his oil insurance business in Casper, he stopped for a break at Murphy's Bar, in Denver, and for the first time in his life, he saw television. "My God! What an invention this is!" he thought.

"I couldn't get it out of my mind," he said. "How do you get that great invention to a small town that doesn't have any TV stations?" Then he read a news story about a man who had figured out how to get television into the homes of people in Pottsville, Pennsylvania. "Hey, wouldn't it be great if we could have television in Casper?" So he hustled out to Pottsville to find out how it worked and became a close, lifelong friend of Martin Malarkey. Daniels said, "I spent two days with Marty and happily paid him 500 bucks a day to pick his brain." Malarkey told him that, to get started, he should go to the city and get a permit. Daniels said, "I'm kind of sorry I did that, because I don't think we needed them in those days, but I did it anyway." But that inquiry led to instant publicity in the newspaper saying, "Some guy wants to bring television to Casper!" And it was all free publicity. Like many of the early permits, or franchises, this one was a simple one-page document. "Believe it or not," Gene Schneider said, "the original franchise for Casper was one paragraph on one sheet of paper that said, in effect: 'We hereby grant you the right to use the streets and alleyways for the purpose of building a cable system.' ... It took five minutes, I think."

Bringing Television to Casper

"I got a group of local oilmen together in Casper," Daniels said. "I had no money. I had 5,000 bucks, I think, I put in the deal." (Schneider recalled it was $9,000.) Daniels went on to say, "I got a group of local oilmen and a prominent lawyer who was later a judge. They had good solid names in the community, and they were my stockholders. We raised a total of $125,000. Then we had another $250,000 of borrowed funds that they borrowed at the bank. But, I had the money to work with."

Gene Schneider said, "One [of the oilmen in Casper] was an uncle of ours, named Earl Lyle, with whom Bill Daniels had become acquainted, socially and business-wise, as well as three other oilmen who were very close friends of Earl. One of them, as a matter of fact, just passed away last week [April 1991] named Jeff Hawks. Harold Barnes was another one of them, and he is still living down in Arkansas. [Another] was Winston Cox of Billings, Montana."

"During the war," Daniels said, "I had been exposed to radar and, although not electronically inclined—and I'm not an engineer—I was indirectly exposed to electronics basics because of radar." So when Earl Lyle mentioned that he had a couple of nephews who were graduate engineers and had just sold a business in Houston, Daniels quickly got in touch with Richard and Gene Schneider and invited them to consider participating in the television venture in Casper. Gene Schneider said, "That's exactly what we did, in late 1952. We each put up $7,000. That was every penny we had! It was small relative to the total. But all of us got some options in the company, and we were treated very fairly. That's how we started our little nest egg."

They knew nothing about the cable business at that time. Gene Schneider recalled, "We spent, not really full time, but maybe a period of two or three months going around and visiting some of the cable systems that existed in the country. One I particularly remember is Tyler, Texas. We visited that system, among others, and reported that we thought this thing worked, but we needed help because we were very young engineers. We did not have the background in RF [radio frequency] delivery of signals like television requires and the use of coaxial cable and all of that. So we ended up hiring, as a consultant to the company, a former Bell Telephone Laboratories engineer named Tom Morrissey." Morrissey had been instrumental in building the television broadcasting station on Channel 2 in Denver.

In 1952, the closest television station to Casper was in Denver, 225 air miles away. No television signals could be received by the public anywhere in Wyoming. Schneider said, "The only way you could get a good signal [from Denver] was to get up on a high mountain, which we did. It was a mountain called The Summit. It's about 12,000 feet, as I recall it, and it's on the highway between Laramie and Cheyenne, Wyoming." At that time, Gene O'Fallon's Channel 2, affiliated with the Dumont network, was the only TV station operating in Denver. However, The Summit was still 125 miles from Casper.

To transport the signals from The Summit to Casper, Schneider said, "We built what I believe may be the first microwave system for cable in the country. ... At the time, we had to do that through the telephone company [Mountain States Telephone Company]. There were no existing FCC licensing procedures or availability for what we today would call private microwave or CARS [Cable Television Relay Services] or private common carriers. At that time, you dealt with the telephone company or you didn't do it. ... We had to put in the pickup site and all of that. We picked up the signal and turned it over to the telephone company. They just acted as a common carrier. They took the signal and then delivered it to Casper at our offices there. We took it back and put it on the cable system." AT&T had provided microwave relay for television programs for broadcasters, but never before for Cable TV. This was the first known use of common carrier microwave for Cable TV.

AT&T actually built the microwave facility for Mountain States. Schneider said, "Originally, the telephone company used Philco equipment, which at the time had not been highly developed for microwave." The cost for leasing the microwave channel was enormous. They had to provide a $125,000 bond before AT&T would start to build the microwave. Or, AT&T said, "You can use AT&T stock to put up as a bond." Schneider said, "In those days, $125,000 was a lot of money. It still is." That's where the oilmen came in. Through the banks where they had connections, the oilmen were able to put up that kind of cash bond. On top of that, he recalled, "We were paying something like $7,800 a month for eight hours a day on that little microwave system into Casper from The Summit outside of Laramie. Again, even in today's dollars, that is a very large amount of money.

"But, to add channels," Schneider recalled, "they just wanted to double, or triple, or quadruple those numbers. It was prohibitive. ... So, we broke the logjam [at the FCC] on being able to get into what we would call a private common carrier, or private microwave. I think we were instrumental, along with Roy Bliss (see Chapter 4), who was involved up in Worland [Wyoming], in getting some of this done. Through all of these efforts, we got permission to build our own microwave and did so. That made it economically feasible to bring in these additional three signals from the networks in Denver. Otherwise, you simply could not have afforded it." Stratford Smith, general counsel to the NCTA, pointed out that the Belknap authorization in Pine Bluff, Missouri, in 1954, although never activated, was the first private common carrier microwave permit granted.[3] Casper's was the first to be put in operation.

COMMUNITY TELEVISION SYSTEMS OF WYOMING

In order to build the Casper Cable TV system, Community Television Systems of Wyoming was incorporated in March 1953 by Daniels, the Schneiders, and the oilmen. "I think maybe we had a fourth—or maybe a third—[of the system] built by the end of the year," according to Schneider. "[Tom Morrissey] took the lead

working with Jerrold Electronics in designing and developing the technical side of the system. But we were right in there helping him," he said. "When we started, we had [only] four or five employees." The system was built initially with Jerrold's single channel strip amplifiers. It was not a broadband system. "At that time," Schneider said, "We had one channel—there was only one station in Denver that we could deliver—so one channel was really all we needed. That equipment was structured so that you could add ... up to three strips, as I remember, by plugging [additional modules] into the same amplifier chassis. We did add channels a little later.

"In those days," he recalled, "solid-state (transistor) technology was nonexistent. We used the old vacuum tubes. So did television sets, by the way. ... They [vacuum tube amplifiers] didn't work like they do today. They weren't designed for, or expected to be used outdoors, where you have huge temperature swings." Maintenance of so many vacuum tubes was a real job. Schneider said, "Most people today would just throw up their hands and say, 'I quit!'... But we got it done. Of course, you didn't do as good a job—even close—as you can do today in delivering quality pictures. But ... if you had a picture, compared to nothing, it looked pretty good, even if it wasn't the best.

"One of the things I remember that caused us problems—not only us but a great deal of the industry—was the strip-braid cable that Times Wire and Cable (Larry DeGeorge's company) came out with [in the latter part of the 1950s]." Times Wire and Cable did a lot of their marketing through Jerrold. "Everybody thought [strip-braid cable] was just great. It had lower loss characteristics, so you could space the amplifiers farther apart. A lot of other good things could be said about it. ... But after being up in the air for a year or so, this cable—probably due to corrosive effect on the braid—started having ... tremendously increased losses. Frankly, it simply wouldn't work." The cure they found in Casper was discovered independently by just about everyone using strip-braid cable. "If you would take something like a baseball bat and drive along [the cable] with a bucket truck and start beating that cable every few feet, it would just come back in fine shape. It became sort of standard procedure," according to Schneider, "that we carry baseball bats on all of our service vehicles."

Just before Christmas 1953, they turned on a long line out to the edge of town. Schneider said, "I think we had something like seventy-five customers that went on at that time." Shortly after New Year's Day in 1954, Community Television Systems had a grand opening in the National Guard Armory. It was a huge event and an exciting time in Casper, lasting for two days. Schneider estimated that some 12,000 visitors came from all over the state and region to see what it was all about. "By today's standards," he said, "you would not rate [the pictures displayed in the Armory] as high quality. ... But then, considering what you had to compare it to—which was nothing!—it looked very, very good! ... The excitement for all of those people, of seeing a television picture for the first time, was just unbelievable. They didn't really care what it cost. They just wanted it."

Because of the high cost of the microwave, the initial charge for connecting to the cable was set at $150, plus the service charge of $7.50 a month, for just the one channel. Although in Pennsylvania and other places where community antenna television (CATV) was beginning to develop, the service charge was only $2, $3, or $4 for two or three channels, the charges in Casper never became a problem, "By the end of 1954," Schneider said, "we had over 4,000 hookups—all at $150 apiece! Keep in mind, the total population of Casper was only 20,000 in those days. ... I wouldn't want to say it too loud right now, but it paid for everything the first year. To the oilmen, it was like hitting an oil well!" Still, there was enormous risk. "In fact," he said, "most people thought we were crazy."

Before the Casper system was built, there was no way to receive television. Consequently, nobody in the state had any television sets for sale. As Schneider said, "We couldn't sell our hookups without television sets. We had to go around to the appliance dealers and plead with them to get in some television sets so they would have something to sell to our customers." But the dealers were reluctant to build up an inventory before they knew whether people would actually pay that $150 connection fee and $7.50 monthly charge. However, for the grand opening, the dealers did bring in a few TV sets to display in their booths in the Armory. "It was really astounding!" Schneider said. "The sets that were there were sold out just overnight. We were signing up people to subscribe to the service like crazy!"

But, "What if the microwave went out?" It was a continuing worry, and, when it did go out, it was a disaster. After all, Wyoming winters are often characterized by severe wind and cold, especially at the 12,000-foot elevation of the microwave site on The Summit. "As a matter of fact," Schneider said, "I can recall times when the wind was moving the dishes around, and the picture was flopping in and out. Dishes would break loose. ... It was a major task for the telephone company to keep that thing operational. When you had a big event, like the Rose Bowl game, or the World Series, or things of that nature, you were always on pins and needles hoping: 'My gosh, I hope this thing doesn't go off.' "

By late 1954, three more television stations had begun operation in Denver, on channels 4, 7, and 9, affiliated with the three national networks, ABC, CBS, and NBC. But, until they got their own common carrier microwave, the Schneiders could not afford to pay the enormous charges to the telephone company for multiple channels of microwave relay. "So, we rigged up a ballot and," as Gene Schneider recalled, "we sent it out every month, or every two months, for subscribers to vote on which programs they would like for us to select." Daniels said, "They just checked what they wanted, and the majority ruled. That was true democracy in those days." But Schneider admitted, probably with a sly wink, that, "Of course, when the voting was all done, we picked up whatever we liked!"

There was no available technology at the time with which to switch the selected programs into the microwave facility at The Summit. "For years," Schneider said, "we had to have a person up there all the time [on that 12,000-foot mountaintop] to do the switching." They built a cement block building—

about twelve by fifteen feet—to accommodate the microwave and receiving gear, with a short tower outside for the television antennas and microwave dishes. "We put a cot in there," he said, "and stored some food and things like that in case they got trapped. There was no particular danger to them, unless they tried to go outside. Then it could be very dangerous, in blizzard conditions. At 12,000 feet, 100-mile-an-hour winds can come up pretty quickly. ... There were some hairy times up there. We used students out of the University of Wyoming, at Laramie. There was more than one occasion when those guys got stranded—they just simply couldn't get out." He said, "We did buy a snow cat, I guess you'd call it in those days, where it could go through almost anything. We had it on a trailer, and used that cat to get in and out of those remote places. I don't recall that we ever had an instance where we couldn't get in if we had to."

After several years of manual switching, Schneider remembered, "Richard developed a thing using a Rube Goldberg switcher. It had little cams that were on a timer ... that would [physically] punch the right button to switch [the selected program] into the one channel of microwave for relay down into Casper."

Finally, he said, "Somewhere right around 1955 or 1956, we got permission to build our own microwave and did so." They were now able to deliver four channels of television programming without the burden of switching on top of that 12,000-foot mountain. And they were now free from the monthly payments to AT&T, as well as the cash bond. But, of course, they were now obligated to maintain the microwave themselves, and that was no small task.

Buyouts and Acquisitions

By 1955, Bill Daniels had moved to Denver to establish a new insurance office. Walt Forbes continued to run Daniels' office in Casper. Some of the original group of investors were happy to stay with the Casper television project, while others, including Daniels and several new investors, went on to build new systems, first in Farmington, New Mexico, then in Rawlins, Wyoming. A theater owner in Farmington had started a system there in 1956 or 1957. Schneider said, "I think he had 300 subscribers. The picture was just godawful! He was just doing a terrible job. He didn't have any technical help. He really didn't know how to go about it and didn't want to spend the money to get help. We acquired that system, I think, for $60,000. ... We went ahead and completed this system, and it became a very, very successful project."

Then they built the system in Rawlins, about 120 miles southwest of Casper. They split the signal off the microwave facility, which had replaced the AT&T facility, to feed the Denver broadcast TV signals to the new system at Rawlins. "That was a very successful project," according to Schneider.

At its peak, in the 1980s, Casper reached roughly 19,000 subscribers, representing at least 85 percent of the homes within 150 feet of installed cable lines. Farmington and Rawlins were much smaller, with possibly 4,000 customers in

Farmington and half that in Rawlins. These two systems later became the acquisitions that started TelePrompTer in the Cable TV business.

In January of 1960, Community Television Systems of Wyoming bought out Daniels' interest, as well as the interest of the four oilmen who had been the original investors. Schneider said, "Really, a great deal of the money we got to buy them out, as I recall it, came from the sale of [the Farmington and Rawlins] systems. ... We brought in some additional investors and were able to raise some more money ourselves." Richard and Gene Schneider were now the principal owners of Community Television Systems of Wyoming. According to Daniels, "Gene, the [younger] brother was the chief operating guy, and his brother Richard was the chief engineer." The corporate name was changed to Wentronics, which, as Schneider told it, "stood for Western Entertainment with Electronics, believe it or not."

Now, they were ready to go ahead and develop other systems. First, they built a system in Moab, Utah, then one in Perryton, Texas (in the panhandle close to Amarillo). Gene Schneider also recalled, "We got involved in Grand Junction, Colorado. That was another long story in itself. That was one of the earliest referendums on cable." The Schneiders were in competition with TeleCommunications Inc. (TCI), Roy Bliss, and two or three others. Rex Howell, who owned the only TV station in Grand Junction, convinced the city that it did not have the authority to issue a franchise without public consent through a referendum, which Schneider thought was probably not correct. Nevertheless, he said, "Those were the days when he [Rex Howell] was fighting the cable by putting up a blank screen [on the television] and saying, 'This is what your screen will look like if cable is allowed in.' " Schneider recalled that there were seven elections before they finally won the thing, by joining up with TCI. "We just kept knocking each other off," he said. "Nobody could get a majority."

EXPANDING WITH CONROY, CROSBY, AND OTHERS

By the mid-1960s, the Schneiders had developed a close relationship with three Texas CATV operators: Jack Crosby of Del Rio, Glenn "Tubby" Flinn of Tyler, and Ben Conroy of Uvalde. They were all expansion minded, thinking of ways to raise funding to acquire systems, obtain franchises, and build new systems. By 1968, they had organized a company named GenCoE (General Communications Entertainment) and pooled their operations. The intent was to go public as soon as practicable, through an initial public offering (IPO). (See Chapter 9.)

George Owen, an old college roommate of Jack Crosby's, was an attorney representing Livingston Oil Corporation of Tulsa, Oklahoma. About the time that Livingston Oil thought it was ready to make an IPO, Owen got to talking with Crosby, telling him that Livingston Oil had something like six million dollars annual cash flow and was seriously investigating diversification into something besides oil. One thing led to another over a year's time, during which the Schneiders' imagination, as well as Crosby's, had been smartly stimulated. "Six million dollars," said Gene

Schneider. "Believe me, in those days that sounded to us like all the money the world ever had! We thought we could do wonders with that in cable." It took about a year to germinate, but, early in 1968, GenCoE merged with Livingston Oil. The GenCoE group represented nearly 40 percent of the company as a result of the merger. Livingston Oil's founder had sold out, and Livingston had around 20,000 shareholders, none of whom owned more than 1 or 2 percent of the shares. As Schneider described the situation, "Really, in effect, we were going public via the back door, because Livingston Oil was a public company."

There was a big surprise waiting for them. Crosby was chairman of the board. Conroy and the Schneider brothers were board members, along with carry-overs before the merger. Crosby had handled the negotiations, primarily with George Owen. Gene Schneider said, "There was just an understanding—that Crosby thought everybody had—that this cash flow of Livingston was going to be devoted to expansion in the cable industry. We definitely controlled the company." They didn't bother to take control of the board, although there was no major stockholder. "I'll never forget that first meeting," he said. "These old oil guys that were on the board ... acted like: 'Well, no. We're going to continue expansion in the oil business.' And, 'Yeah, we'll put some money in cable but we're not going to devote the bulk of this money to cable.' So, here we were. It hit the fan right then and there. We discussed the idea of a proxy fight ... to change the board, which we could easily have won, because it was a New York Stock Exchange company."

According to Schneider, "Jack Crosby and Fred Lieberman, founder of the Telesystems multiple sytem operator (MSO), were the kind of people by nature that didn't want to get into fights of that type. I was different. I was ready to do it, and it would have been a hands-down, slam-dunk. We could have won it. We would have had to remove them all and, in effect, we would have had our six million dollars. So Jack and Fred backed off. After another meeting or so, they just resigned from the board and said, 'The heck with it.' Then the Livingston people asked me to move to Tulsa and run the cable company and, of course, to remain on the board. It was kind of interesting, because I became the largest individual shareholder in Livingston Oil." The Schneiders then traded the systems at Del Rio and Uvalde back to Crosby and Conroy, and took back equivalent shares of Livingston stock. Schneider said, "That ended that. Well, that was when I moved to Tulsa, in August 1968."

Tulsa

Although Schneider would rather have stayed in Casper, he said, "There were two reasons why I moved to Tulsa. One was that the Tulsa franchise was beginning to heat up, and we thought that if we moved the headquarters out of Casper for GenCoE [the cable subsidiary of Livingston Oil Corporation at that time], it could enhance our chances of getting the franchise. Also, they kind of wanted it there because the control of the board was there, and they all lived there. ... We did

leave the engineering function with my brother, Richard, in Casper, and it remained there, even when we moved back to Denver in 1977. It worked out very well. In this computer age, we were able to handle the purchasing and the engineering functions and all that very well." Schneider added, "We did change the Livingston Oil Corporation name to LVO Corporation. It may have been 1969 or 1970."

Schneider recalled, "We had a very ferocious competitive situation [in Tulsa], with actually two of the three network stations, one of them owned by the Kerrs and the other one by the McGees. Both filed for the franchise against us—along with some other applicants who very quickly seemed to fall by the wayside. Basically, it boiled down to those two television stations and LVO Cable."

In June 1971, the franchise was granted to LVO Cable. Schneider said, "We actually got a pretty good franchise in Tulsa. It was livable. To my memory, we never felt compelled to go in and change anything in that franchise. It was acceptable and workable. ... Fortunately, in those days, I don't think the franchise thing had heated up as badly, with so many promises that people felt they were forced into making. It hadn't really come about quite that early, but it wasn't much longer after that it got out of hand."

Schneider said, "We did start construction on that system—I believe it was in 1973. That was a rather aggressive thing to do at that time because that was, of course, pre-satellite days. Really, we were competing with three networks, an independent, and Public Broadcasting Service in Tulsa. So, the competition was quite heavy from a cable versus off-air perspective. We did build approximately a third—600 miles—of this system.

"Interestingly enough," Schneider said, "[We built it] basically with Magnavox money." Asked how they managed that, he replied, "Everybody was anxious to sell equipment in those days, and the manufacturers were doing some very high-level financing. Most of the money they put up to build the system was on a non-recourse basis. That was probably the only way we could have done it at that time."

Schneider said, "We really had a very tough time marketing this system. ... Fortunately, about the time we completed the 600 miles is when the satellite services started hitting [late 1970s]. We immediately put in one of those ten-meter dishes, thirty feet in diameter [at a cost of $125,000]. I think it was the second one in the United States. Bob Rosencrans put the first one in down in Florida. I think that HBO [Home Box Office] was all that was on that satellite, if my memory is correct. However, in subsequent years, other competitive services to HBO, as well as other services, rapidly started to come on there. TBS—Ted Turner's station—went on there, and things like that. It did turn the system around rather quickly, from a marketing viewpoint. We then arranged for additional financing and built out the rest of the system over the next three or four years. Today [1991], as a result of the merger, it's still owned by United Artists Entertainment. I think it's right around 175,000 subscribers today."

From Livingston Oil to United Cable Television

LVO Corporation never did do a lot in the oil business, although, as Schneider said, "They were using a considerable amount of their funds—even subsequent to 1968—to try to further develop things in the oil business. They did devote quite a bit of their money to the cable side of the business, which they owned at that point in the form of GenCoE. We did feel, and the board felt, that they did not want to furnish all the money that LVO Cable needed. So, in 1971, we had the initial public offering on GenCoE. By that time, we had changed the name to LVO Cable. That was handled by Bear Stearns and was a very successful offering that went out quickly. We raised several million dollars for cable expansion that way."

Schneider said, "There was another offering a couple of years later—I forget the exact dates—to raise additional funding for expanding the cable, which we were doing quite rapidly. We had obtained some significant franchises, and most of the cable systems that we developed through those years—and that we have even today—we actually built as opposed to buying. Most of TCI's growth came through purchases as opposed to ours coming from actual construction."

Early in 1974, LVO Corporation decided to merge with Utah International, a multimillion-dollar Salt Lake City company engaged in the oil and manufacturing business, among others. Schneider said, "Utah International had decided—probably much to their regret later on—that they did not want to get in the cable business. As a result of that decision [in 1974], LVO Cable was spun off to the LVO Corporation shareholders in the form of a dividend. Each holder of 100 shares of LVO Corporation received sixteen and two-thirds shares of LVO Cable. That made LVO Cable an independent, publicly held company.

"While this was going on," he said, "I organized a new board for LVO Cable, [as] United Cable Television Corporation, and that is exactly how it went out in the spin-off. I selected some people with whom I had been acquainted, primarily in the Wyoming area, to participate in the ongoing operations of United Cable Television Corporation. Some of them were ranchers with whom I had done some business in Casper. Al Carollo, to this day, is still on the board, as well as one of the ranchers.

"At that time," Schneider recalled, "they all owned a few shares of LVO Corporation, which in turn gave them shares in LVO Cable [now known as United Cable Television]. As a fairly substantial stockholder in LVO Corporation, I got a [substantial block of shares in United Cable] in the spin-off. We started a buying program in the open market of [United Cable] shares. At one point, as a group, we had gotten up to [where] maybe 40 percent of the entire outstanding stock was held by the board. In subsequent years, this got diluted down through expansions and underwriting and other things. This group worked very close together and really is the group that developed United Cable, by the late 1980s, into the seventh largest [MSO] cable system in the country, with over 1.2 million subscribers."

Shortly after winning the Tulsa franchise, United Cable Television obtained franchises in Albuquerque, New Mexico; Chattanooga, Tennessee; and Columbia and Charleston, South Carolina. "During the middle part of the 1970s," Schneider recalled, "there was a tremendous money crunch. In fact, I don't think even General Motors could have done very well borrowing. There just simply was no money. A lot of these franchises had deadlines for starting construction, completion dates, bonding requirements, and whatever. We felt that we had two choices. Either [we would have to] face some very tough battles and most likely lose them, because ... we just simply did not have the money to build all of them, and there was no borrowing to amount to anything. So, we ended up disposing of all four of those franchises.

"The Tribune Company bought [the franchise in] Albuquerque. Of course, they had money. A wealthy independent family in Rome, Georgia—the Smithgalls—bought Chattanooga. They had a lot of television stations and things like that. ... In some of those instances, we did keep an earn-out position. It took years before we were totally out of them. So, we got a lot of money in the end, as they were built out over a period of years. ... Probably, looking back, we might have been smarter to have fought the battles with the cities and try to keep them, as opposed to transferring them to someone else. Anyhow, that's what we did. That's hindsight."

In 1974, at the time of the spin-off from LVO Corporation, the decision was made to move United Cable Television headquarters to Denver, although the move was not actually made until 1977. Schneider said, "At that point, we had no more ties with LVO or any other reason [to stay in Tulsa], other than the fact that we owned the large system in Tulsa. But we wanted to get to Denver. You go to Tulsa if that's the only place you're going. You go to Denver where you [can go] to a lot of places. We wanted to get into the mainstream transportationwise. Of course, the cable publications were here and a lot of cable companies. We felt more comfortable being here and it worked out very well when we came."

There was another motivation for moving to Denver. As Schneider said, "This franchise was heating up and we wanted to get in on that. We had a ferocious battle with our good friend, Bill Daniels, over Denver itself. But we ended up getting virtually all of the suburbs, which was really the best part. We have about 170,000 subscribers now in the Denver suburbs. Daniels, in combination with American Television and Communications Corporation, got Denver. ... The Denver system had a tough time. I suppose you'd relate that to some terrible mistakes they made on construction. ... And then the demographics of Denver are not nearly like the suburbs as far as being good cable potential. Anyhow, we ended up with the cream of the crop in the whole area."

Schneider went on to say, "It's interesting how that came about. As a matter of fact, a company called CableCom General, [run by] Bob Clark in conjunction with Daniels, early on without much competition, had gotten franchises in most of these suburbs. I think Daniels was primarily responsible for getting that done, and he had optioned those properties to CableCom General for $25,000. ... I think Bill

needed some money occasionally! ... Anyhow, this option was expiring, and they [CableCom General] didn't want to pick it up, believe it or not! So, we got wind of it, put up the $25,000, and they assigned the option to us. That's the way we got all those franchises without even going to a franchise hearing or anything else. ... We were heavily involved in Denver itself. In fact, we spent over $3.5 million trying to get Denver, which is an interesting number. But, in the suburbs, we got those by picking up that option! ... Bill and I had a little strained time right in there over that. But business is business."

Limited Partnership Financing

Schneider discussed his approach to raising capital for all these projects. "We did borrow reasonably heavily. We didn't over-leverage the company like some probably did. We did some underwritings, convertible debentures, straight debentures, one or two equity issues—fairly substantial sums in the hundreds of millions of dollars. ... [We used] another major financing technique that worked very well in Baltimore, Los Angeles County, Oakland County [Michigan], and parts of San Francisco. We set up what we call limited partnerships."

According to Robert M. Jones, CPA and financial consultant to The Strategis Group [in a letter to the author], "Limited partnerships consist of a General Partner who provides the organization, direction, and operation, along with a group of Limited Partners who provide the bulk of the equity investment, perhaps 90 percent or more. Gene Schneider's Limited Partners were entitled to 100 percent of the tax benefits (e.g., taxable losses) during the construction, build-out, and developmental periods of the system, but bore liability only to the extent of their investment, regardless of actual losses incurred by the limited partnership. Ownership division in the partnership was determined by the terms of the Partnership Agreement, usually fifty-fifty between the General Partner and the group of Limited Partners. Then, combined with the Limited Partners' equity investment, the General Partner would implement a debt structure with traditional lenders—insurance companies, banks, and institutional lenders—in order to put together the total funding required for building the system."

Schneider continued, "Basically, we set up a subsidiary to become the general partner. ... [The general and limited partners were expected to maintain the fifty-fifty ownership status for] five years following completion of 50 percent of the system, a six-year period of time, or maybe a little more. After that time, the [limited partners] would have what we call a *soft-put* against us, the general partner. By soft-put, I mean that we did not actually have to buy [the limited partners' 50 percent ownership] when offered. They would put it [to us, the general partner] at a fair market appraised value. If we didn't accept it, or they never put it to us, then at the end of seven years, we would have a call, at fair market value, to buy out the limited partners."

Since the system would be mature at this time, rather than in start-up or development stages, Schneider said, "We could generally refinance and buy out

the limited partners, even at fair market value, because we were only [paying half the overall price] of the system. Without really putting any more [investment] money in it, or very little more, we [the general partner] would own it all. ... It was a very successful technique of financing. It was good for the limited partners and good for us as a method of raising money. Another part of that—I guess, a very important part—is that the limited partner always got his money out 100 percent first, before you started sharing the fifty-fifty arrangement."

Jones explained further, "If the General and Limited Partners agreed to sell the system prior to the *put/call* periods, the Limited Partners would always recover their initial investment, after repayment of debt. But, in addition, they would also share with the General Partner the remaining proceeds (profits) of the sale based on the ownership division provided in the Partnership Agreement, usually fifty-fifty."

THE TCI CONNECTION

"As we all know," Schneider said, "TeleCommunications Inc. (TCI) was very, very aggressive in the industry in making acquisitions. It might have been 1983 when they began nibbling away at our stock in the open market. Of course, you know, if you get up above 5 percent, you have to file a public document with the SEC stating what you have done and what your purpose is. Well, knowing Bob Magness and John Malone [chairman and president of TCI] very, very well through all these years, when we got wind of this, we sat down and talked to them. We reached an agreement that, as part of an underwriting we were doing at that time, we would agree to let them buy a block of that underwriting, bringing their interest up to about 23 percent of the company, I believe it was. As part of that agreement, we entered a standstill agreement that they would not buy any more of the company's stock. They would take no position in management. Under most circumstances they would vote with the board of directors of the company, but would take no position [as officers] on the board. They would just hold [the stock] as a peer investment. That agreement is what we entered into, and it worked very well. We got along very well with them."

Schneider explained further, "This was during that period of the 1980s—the famous days of unwanted takeovers, raids on companies, the leveraged buyouts, and all of that was going on. We felt that this gave the company material protection against that kind of thing happening to United Cable. Of course, we didn't want that kind of thing to happen at all. We wanted to continue to develop the company—and did. You can speculate that had we not done that agreement with TCI, somebody might very likely have taken a run at us. ... By then, through issues of additional stock and raising equity for expansion, the board had been diluted down, as I recall it, to the 21 or 22 percent area. But combined with TCI's [shares], it put us back over 40 percent. It wasn't over 50, but it was plenty." The agreement did not include a buyout arrangement. Schneider said. "At the end of the ten-year

period [1993], all bets were off. ... [By then], you might have negotiated something else."

United Artists Entertainment

Schneider then explained subsequent negotiations between TCI and United Cable, before the expiration of the agreement. "Well, see," he said, "what happened, and this is probably one of our motivations in doing the United Artists Communications merger with United Cable Television Corporation in May of 1989... [TCI] already had a 60 percent control of United Artists Communications and had 26 percent of United Cable Television or something like that. TCI very much wanted [to combine] these two companies. By combining [them] and buying a little more stock, TCI ended up with about 54 percent or so of the two combined companies. Really, then, they had control of the entire situation, which is always what TCI wants. ... I'm chairman of that combined company, called United Artists Entertainment. Of course, I kept all of my stock that I could arrange through the merger. I'm probably the largest individual stockholder in that company."

United International Holdings and Blockbuster

Schneider added, "I might mention that, as part of that, United Cable had started developing overseas activity in the late 1980s. We were really about the first company to get into England and other places overseas. We're moving that along quite well. TCI had a very conservative attitude towards that, and so did some of the United Artists people. Prior to the merger—and this was fully disclosed in the merger—they [United Artists Entertainment] agreed to sell the overseas properties and investments, including the Blockbuster stores that we had started here in the U.S., to a new company that I formed called United International Holdings. ... So, that's how United International Holdings got started, and that is where we are today [1991]."

During the mid-1980s, before the merger, he said, "We [United Cable] had been approached by Wayne Huizenga, the head and chairman of Blockbuster [video rental stores], who had quite a background. He had put together a waste management company [by going around and acquiring] these little 'mom and pop' garbage companies all over the country. He combined them under one corporate umbrella, spruced them up and made a nine-billion-dollar company out of it in a few years. Wayne then got into this Blockbuster idea. He wanted to get a cable company involved with him in it, and we're the ones that did it. With the exception of Wayne, United Cable became the largest stockholder in Blockbuster.

"We were the largest franchisee of Blockbuster," Schneider said. "We have franchise rights to about 127 stores, and about 95 or 97 of them are now built and operating. About 20 of them [were] built under United Cable, and the balance have been built since we took it out of United Artists Entertainment. ... It is a very substantial company that is owned by United International Holdings today.

You know, that company is grossing eighty-five or ninety million dollars now [1991]."

As an interesting sidelight, he said, "The way Blockbuster is structured, they now have probably some 1,600 stores, about half of which are franchised, and the other half are company owned and operated. Wayne Huizenga bought, outside of Blockbuster, the Joe Robbie Stadium [in Miami]. As a result, he got about 15 percent of the Miami Dolphins and now is a major applicant for the baseball major league expansion franchise down there. He's hoping to put that in his little stadium. Wayne is a big-time operator."

POSTSCRIPT

Throughout his entire history, Richard Schneider was always the chief technical officer and a member of each of his company's board of directors. Until his untimely death in 1991, he conducted business from his office and laboratory in Casper, Wyoming. His brother, Gene Schneider, is still active, in 2001, as chairman of United International Holdings, living in the Denver area.

NOTES

1. *Gene Schneider, An Oral History,* interview by E. Stratford Smith, April 1991 (Denver: The Cable Center).
2. *Bill Daniels, An Oral History–Part 1,* interview by Max D. Paglin, February 1986 (Denver: The Cable Center).
3. *E. Stratford Smith, An Oral History,* interview by Pat Parsons, March 1986 (Denver: The Cable Center).

CHAPTER 11

CLAUDE STEVANUS

Claude Stevanus was an early cable television pioneer, starting in his hometown of Sugarcreek, Ohio, in 1950 and expanding through eastern Ohio and western Pennsylvania. He started a business in Cleveland selling closed-circuit television equipment, primarily for instructional television in the schools. He served several years on the NCTA Board of Directors. In 1971, he merged his company, Tower Communications Inc., with Jack Crosby and Ben Conroy in Communications Properties Inc. Claude Stevanus' story is told largely from his Oral History interview by Kathleen Pavelko, in October 1990.[1] Stevanus died July 17, 2002.

FAMILY BACKGROUND

Claude Stevanus was born in 1913 on a small family dairy farm in the vicinity of Sugarcreek, Ohio. His parents were of German and Pennsylvania Dutch descent. Stevanus recalled that they milked about thirty cows and hauled the milk to the Swiss cheese factory. The family lived on several different farms in the area. He said, "Farming was the pits at that point." Because of the bitter days on the farm during the Depression, both Claude and his younger brother, Edgar, wanted no part of farming.

Claude graduated from Sugarcreek High School in 1931. He said, "I married my wife soon after graduating from high school and in desperation took a job in her father's hardware store. My father-in-law was R.D. Burger, and my wife's name is Mary. Of course, I married into the job. It was a small, dirty, dingy country hardware store. I went to work for him, and I had a pretty miserable five or six years there until I was able to prevail upon him to enlarge the hardware store. From there on, I sort of ran the store. In the late 1940s, we started selling television sets."

Mary and Claude Stevanus have two grown, married children, Claudia and Timothy, who still live in the Sugarcreek area. Stevanus said, "I might tell you that nobody ever leaves Sugarcreek, unless they leave right out of college. Many that do leave come back to Sugarcreek to spend their declining days." Son Timothy earned a degree in radio and television broadcasting at Ohio University (in Athens). He was put in charge of a rather complete local origination studio at one of his father's cable systems. When Claude Stevanus retired, Timothy also left the

operation and decided to go into business. He now runs a hardware store in another town, twelve miles from Sugarcreek. Daughter Claudia's husband now runs the family hardware store in Sugarcreek. Claude Stevanus said. "What I do in retirement is do the accounting for these two stores on my personal computer." Mary and Claude have four grandchildren.

In the fall of 1931, Stevanus went to business school. He said, "That was in the heart of the great Hoover Depression, and we lived on a farm. There wasn't a lot of money for continuing education, but [two-year] business school was within our financial means." His father was a mail carrier and fared better than many who did not have good-paying jobs. Tuition at the business college was $1 a day, and he lived on $5 to $10 a week for board and room. That was within his parents' financial means.

When he finished business school, he went to work for a local flour mill. But that fizzled when one of the owners returned and wanted his old job back. There were simply no jobs. Stevanus liked to elaborate on this by recalling, "Milt Shapp told me many times that when he graduated from Case Western Reserve University with a degree in engineering, he drove a coal truck hauling coal from New Philadelphia to Cleveland. This gives everybody an idea of how work was at that point, because here was a man who was an electrical engineer."

TOWER ANTENNAS INC.

In the late 1940s, Stevanus started selling television sets from his father-in-law's hardware store. Sugarcreek was sixty-five miles from the Cleveland television transmitters, which at that time were still operating at low power. Signals in town, below the surrounding hills, were very weak. Stevanus said, "We struggled putting up the large antennas on rooftops and so on. Naturally, when I found out about the concept of cable television, we knew that when we would install a television antenna somewhere in a high area, there would be pretty good signals."

It was at a Philco dealer's meeting in Akron, probably in 1950, that Stevanus got to talking with a man who told him about community antenna television (CATV). Stevanus recalled the man's story: "You string this cable. ... You erect these antennas, run cable down, charge people $125 [for installation], and you charge them $3.50 a month [for service]. And this liquidates itself in a year or two. It sounded good to me."

It happened that Paul Snyder, an electronic parts distributor he knew, had taken a job with Jerrold Electronics Corporation. So Stevanus called Snyder, who came down to Sugarcreek to explain how CATV worked and to answer questions about technology, finance, and operations. Stevanus married into the hardware business, but, he said, "The cable business was my own idea. ... Anyway, that's how I learned about it, and because we were struggling with the rooftop antennas, and it was an opportunity to sell more television sets and have more satisfied customers, we decided that we wanted to do this. ... Even though Sugarcreek had only about 400 to 500 homes, we decided we could make a viable situation out of it by

spreading the risk among several people. So, I got ten other people, and we each put in a thousand dollars and built this little cable system." It took only seven miles of plant to wire Sugarcreek. In 1952, they formed a company called Tower Antennas Inc. to build and operate the cable television system in Sugarcreek. Stevanus said, "The way it got its name was that we put the antennas up on a city water standpipe. Tower Antennas Incorporated was the name of the company for many years."

Stevanus had some trouble convincing other people to invest. Paul Snyder's father was the local Ford dealer, who said, "Gee, I like television. I'll invest $1,000 to get good television." The other TV dealer in Sugarcreek went along. Carl Tucker invested and was employed as the technician for the system when it got started. Bill Ray, an Ohio Power Company lineman, invested and was hired to construct the cable plant. Stevanus said, "A lot of people turned us down. We didn't get the first ten people we asked. But we got the $10,000. ... I don't really think any of them invested just because they figured it was something that would pan out to make a lot of money."

One day while the plant was under construction, a man walked by and said, "Who do you think is going to hook onto that after you get it done?" Ray said, "I don't know, but there's about ten of us who are going to have damned good television." Ray's helper on line construction was a young man, not more than twenty-one, who lived in town and worked for the telephone company. Stevanus wanted to compensate him with stock in Tower Antennas Inc. He replied that stock would do him no good. He wanted money. Twenty years later, however, Stevanus happened to meet the young man in a bar. He had been drinking beer and commented on how well the company had done. He said, "They offered me stock in that company. But I was too damn dumb—I didn't want any stock."

Ohio Power Company, a division of the American Electric Power Company out of New York, owned most of the utility poles in town. Tower Antennas Inc. was not the first Cable TV system to apply to Ohio Power Company for pole attachment permission. Stevanus knew the man who had negotiated the first such agreement and had quite a chat with him. According to Stevanus, "He said that, when they got the first application, they went to the phone company with whom they always had a working agreement, and asked, 'Is this something you should be doing?' The telephone company replied, 'We've had experience with wired radio, and we want no part of it.'" Stevanus added, "The power company probably never would have given any pole agreements if the phone company had said, 'Yes, we are interested.' Later [the telephone company] got interested. Anyway, we had the pole contract."

Pole attachment agreements generally require substantial performance bonds to assure removal of cables and equipment in case the operation had to be terminated. Stevanus said, "Insurance companies did not want to grant performance bonds based on a strictly cash guarantee. They felt that, 'OK, so we'll put $50,000 in some stuff that's up on [the] poles. If you fold up, there's nothing

there that you can sell except maybe some scrap copper and so on.' So it was very difficult. Usually, your directors had to personally go on these performance bonds. It was very difficult. Just like the banks were so hard to deal with in the early years and that was the reason. You didn't really have assets that anybody could reclaim if you folded up. It looked like a harebrained scheme."

Stevanus said, "To get the bonding, we personally went on bonds in the early years. We finally found a bonding company, after about the third system that we built. We went to the home office of the insurance company and sat down and really explained what this was all about, and that it was really just a contribution to the insurance company, because we weren't going to fail. We were confident, and we were able to convince them. So, we found an insurance company that would write these bonds, but I think they still tried to get us on them personally." Although Stevanus recalled that some cities and some utilities required a million-dollar bond, theirs were generally in the $50,000 range.

"Relationships with the electric power utilities were always very good," according to Stevanus. "We had some relationships with the phone companies in the bigger places that weren't so good, because they kept raising the pole rental rates." Rates ranged from $2.50 per pole per year to $5, until the FCC stepped in and established a formula that cranked the rates back to $2 or $3. Stevanus said, "At one point, we refused to sign a new agreement [with Ohio Bell] that raised the rate to $4.50 or $5. They were at the point where we had received a final letter telling us to 'sign this by a certain date or we will cut you off the poles.' They never did, of course. They had enough problems of their own with the public not to participate in the one they would create by cutting us off the poles.

"We always claimed that this was windfall revenue," Stevanus recalled. "We figured that the number of poles that we were using at $4 a pole was not too bad. It may have been a windfall, but it was just revenue from the little space we used on the poles. Nobody wanted another set of poles. We could not set poles. We never had permission to set poles in the city. The city did not want another set of poles, so you deal with these people, which we did. But they were arrogant! ... That was one of the big pieces of overhead in those days."

EXPANDING TO LARGER MARKETS

Stevanus said, "We saw, even back in those years, that money was being made in this business." Tower Antennas decided it wanted to find larger markets for expansion beyond the Sugarcreek CATV operation. Stevanus got to be a good friend of Lee Zemnick, who was in charge of the Jerrold Electronics distributor in Cleveland, from whom Tower Antennas subsequently bought the equipment for the Sugarcreek system. So he went to Zemnick and said, "Find us a place to start up a cable system in a bigger community." Stevanus said, "Jerrold engineers came down to do signal tests in Coshocton, Ohio, which was about twenty-five miles from Sugarcreek. We participated in the signal survey, and we had a really good

[experience] with Jerrold, as we followed their operating advice. Coshocton now has about 7,000 subscribers."

Stevanus said, "You probably have known about the engineering agreement that Jerrold had in those early days. I have always felt it was a wonderful thing for somebody wanting to start in the cable business. You rubbed elbows with their field engineers. They took you into Philadelphia where they had schools ... and you got off on the right foot. ... I think that's one of the best things Jerrold ever did, as far as educating people. I think it was responsible for the fact that they were always the leading manufacturer in the field. ... It restricted you from buying even a connector from anyone other than Jerrold. We didn't want to anyway, so it didn't bother me. But you paid them $5 for every new hookup and twenty-five cents a month [for each subscriber]. For this, they would send an engineer in twice a year to balance out your system, check it out to see whether it was all right. A lot of people screamed and just quit paying. We finally bought out the agreement, too. But during that time, all these guys that came in were really good technical people. I would pick their brains, and our technical people would work with them and learn about the technical operations."

In 1953, Tower Antennas began to build the Cable TV system in Coshocton. "The partners that I had, the early investors, were very conservative individuals," Stevanus said. "So I was very conservative to try to find places that we could handle out of our cash flow." In Coshocton, they were able to take advantage of the contribution-in-aid-of-construction accounting by which the fees charged by utilities to cover the cost of line extensions would not be taxed as ordinary income. Stevanus said, "Therefore, the money for the plant was not depreciable, because they [the utilities] had already had their deduction for it. But, if you sold 100 cable connections for $125 apiece, that gave you a nice chunk of working capital. So, in the cable industry, a lot of us used that for enough years that by the time it went through the tax courts and everything, and they decided that doesn't apply to Cable TV ... we had the advantage of it in those early years. ... In Coshocton, [installation fees for] 2,500 to 3,000 subscribers at $125 apiece [were not subject to income tax], so that provided a nice chunk of working capital."

Stevanus said, "We found out very early that there was going to be a limit as to how many people would pay $125, even though they might spend $200 to put up a tower and buy a booster, and still not get good reception. ... So we started a rental plan. Now you can choose. You can pay $10 installation and $5.50 a month. Or, you can pay $125 installation and $3.50 a month. For a while, it was about fifty-fifty [half at $5.50 and half at $3.50]. We were very happy if they took the $10 thing, because it was $24 more a year [$2 more each month]." Later on, the $125 installation option was dropped to $10, and all service fees were raised to $5.50 per month.

From 1953 until 1956, Tower Antennas did no further expansion. Jerrold kept suggesting prospective locations, one of which was Beaver Falls, Pennsylvania, about thirty miles to the north of both Pittsburgh and Steubenville, Ohio.

Stevanus said, "They were getting pretty good signals. But Beaver Falls is down in a hollow. ... Even with the proximity to Pittsburgh and Steubenville, we took the risk [in 1956] and built the system in Beaver Falls. It was the first place where we had some trepidation about risk, because of the local signal, and it was very slow growing." They borrowed $15,000 or $20,000 for the Beaver Falls construction. Stevanus said, "The local banker, who was one of our original investors, kept bugging me: 'When are we going to get this loan paid off?' Leveraged financing was just not in his vocabulary."

The Beaver Falls system also called for some creative technology. At that time, most people believed that three channels—to carry the three national TV networks, ABC, CBS, and NBC—were all that would ever be needed. "Who needs more?" was the conventional wisdom. By early 1957, however, four television stations (two UHF) were already in operation in Pittsburgh, with two more VHF stations about to go on the air. There was a VHF station in Wheeling, West Virginia, and another in Steubenville. All three UHF stations in Youngstown, Ohio, started in 1953. While some were operating initially at low power, they were potentially able to transmit signals that could be received on the high ground near Beaver Falls.

Obviously, Jerrold's three-channel strip amplifiers could not do the job, and even five channels would not be adequate. Stevanus said, "I'm not sure that we were the first people to distribute more than five channels. We used a jury-rigged system that we had talked about with the [Jerrold] engineers. We used a broadband, low-band amplifier for channels 2, 3, 4, 5, and 6. Then we used a strip amplifier that Jerrold had developed, using non-adjacent channels to distribute channels 7, 9, 11, and 13. Lo and behold, we had a nine-channel system, which helped to sell it [to the public]." However, the high-band strip amplifiers required a lot of maintenance. Stevanus said, "I think each strip had seven or nine [vacuum] tubes, so you had all the maintenance that you had in the early three-channel systems that also had many tubes. We operated that, I suppose, for four or five years before an all-channel amplifier became available. We were pioneers in that respect in Beaver Falls." (Author's note: Actually, the broadband, distributed gain "chain" amplifier was developed about 1948 by Fitzroy Kennedy and was available from Spencer-Kennedy Laboratories for twelve-channel Cable TV service by about 1951.)

TOWER COMMUNICATIONS AND MPATI

To build and manage the Beaver Falls system, Tower Antennas hired a Jerrold sales engineer from Cleveland, named Raymond Leporati. After several years, about 1960, Leporati persuaded the company to let him start a sales business in Cleveland, selling closed-circuit television equipment. The name of the company was changed from Tower Antennas Inc. to Tower Communications Inc., partly to accommodate the new business in closed-circuit television equipment sales. But

also, Stevanus said, "We had always thought, as time went on, that *antenna* was a dirty word as far as a cable company was concerned."

At that time, considerable interest in wiring classrooms for television was sparked by the Midwest Program on Airborne Television Instruction (MPATI).[2] The program was supported by grants from the Ford Foundation to explore the feasibility and usefulness of a system of airborne television instruction based at Purdue University in West Lafayette, Indiana. Two UHF transmitters were installed aboard each of a pair of DC-6 aircraft, along with retractable transmitting antennas, microwave links, and associated equipment for broadcasting two channels of instructional classroom television. One or the other aircraft was in the air for five hours during each school day, flying a figure-8 pattern at 23,000 feet altitude above Purdue, where the studios were located. Instructional programs could be received over a wide area of approximately 200,000 square miles, reaching into six midwestern states: Illinois, Indiana, Kentucky, Michigan, Ohio, and Wisconsin.

Tower Communications, under Leporati's leadership, wired a lot of schools to receive the MPATI programs. Stevanus said, "That was one of the things that we did to make a little more profit." They even set up a translator to rebroadcast MPATI signals to a large high school in Cleveland. In Coshocton, Tower Communications equipped the television studio in the new high school, as a public service. They also picked up the educational TV (ETV) broadcasts from Cleveland for distribution on the cable plant to schools as well as public subscribers. Many schools began videotaping programs for use at other times. Stevanus said, "Yes, we did a lot of work with ETV for the schools at that time. I remember I was on an NCTA educational television committee with George Barco. ... The cable industry has always shown a lot of interest in ETV." Virtually all of the stations licensed for educational TV service are now affiliated with the Public Broadcasting Service network.

About 1964 or 1965, Tower Communications bought two systems in Ohio, built several years earlier. Cambridge is about twenty-five miles southeast of Coshocton, with roughly 3,500 homes. Newcomerstown is about eighteen miles east of Coshocton, with perhaps 1,000 homes. A little later, they built a new system at Ironton, with about 3,000 homes a few miles west, and across the Ohio River from Ashland, Kentucky. "Until then," Stevanus said, "We had done it all with our own cash flow, other than a little borrowing for Beaver Falls. At that point, we approached somebody from the Ohio Company, an investment banking firm in Columbus, Ohio, and we did a small public financing. I had attended conventions from 1953 on, and I picked a lot of brains and talked to a lot of people, always including the Jerrold people. Going public was the thing—or 'whom do you know?'—to get more financing. The banks were still lukewarm on financing such a wild thing as cable. So, we had a small public offering. As I recall, we sold $200,000 worth of stock and $200,000 in debentures."

CITIZENS FINANCIAL CORPORATION

With the cash generated by the closed-circuit sales business and the proceeds of the public offering, Tower Communications was ready to move ahead. Dick Johnston, an investment banker, was a member of Tower's Board of Directors. Stevanus said, "He was quite a gung-ho guy." He left the investment banking firm and joined Citizens Financial Corporation, a diversified financial services group in Cleveland, which had a full-service bank in Newark, Ohio, and a savings and loan bank, among other things. "In 1967," Stevanus said, "[Johnston] talked us into the idea that it would be a great thing for us to merge with [Citizens Financial], in an exchange of stock. They were on the American Stock Exchange."

Stevanus said, "Against the better judgment of my cohorts, I talked them into ... splitting our stock down about 60 to 1, because the book value of our stock before we went public was much too high to sell to the public, so we split it down to $10 a share. I think that in the stock exchange, we got four of their shares for three of ours. ... By the time we merged with them, their stock was like $20, which made our stock worth $20 also, or more, and just going along great." Stevanus continued as president of Tower Communications, which became a wholly owned subsidiary of Citizens Financial Corporation. According to Stevanus, after the 60:1 split of the Tower stock and an exchange of four shares of Citizens stock for three shares of Tower, the transaction was quite favorable. "Anyway," he said, "they helped us because we had access to financing. We made a number of acquisitions."

Notable among the acquisitions were New Philadelphia and Dover, Ohio, ten miles east of Sugarcreek, in Tuscarawas County. Some local people had started the New Philadelphia system at about the same time (1951–1953) Stevanus was starting in Sugarcreek. However, he said, "[The New Philadelphia group] decided that anyone who bought $500 worth of stock would get a free $125 hook-up and free service for life. ... When Tower Communications [Citizens Financial] merged with New Philadelphia and Dover [in 1967], the New Philadelphia group had about 14,000 subscribers. However, about 160 people were still getting free service. When these folks were notified they would have to start paying, some of them screamed."

Stevanus said, "Their secretary's notebook makes extremely interesting reading. Here they had a board of directors made up of about fifteen guys who were all substantial businessmen in New Philadelphia. None of them knew anything about the cable business or even about electronics. Some of the decisions they made and some of the things they kicked around were really ludicrous. ... Instead of trying to educate themselves by going to Jerrold's school, which was a very good way to find out about [the business], they just went out and got 75 or 100 people to pay in $500, and they built this system. They ran the lines down into town and had a public showing. Then they ran into trouble. They had trouble keeping good signal quality, and they grew very slowly. Because they progressed

so slowly, they ran out of capital. They wanted to keep stringing cable, so they sold some more memberships."

About the same time, said Stevanus, "We started building [in Sugarcreek]. I think even in our little town we surpassed them in number of subscribers. ... The difference between the way we started and the way they started was the fact that we made a point to do what Jerrold said, and to learn about the operational system. We had a pretty good technician. We started right, and we never had the troubles they had, because they didn't listen to anybody. They just stumbled along."

According to Stevanus, "They did not have a good technician. ... They did not [even] have a field strength meter, which is a tool you absolutely have to have." The New Philadelphia system did not have automatic gain control to compensate for temperature changes from day to night. "So," he said, "everybody had a key to [their] headend. At night, as the temperature changed, ... the signal [overloaded and distorted the picture]. Whoever first noticed this would go to the headend and change the gain until the distortion would go away. The next day, in the warmth of the day, [the signals] would go down in the snow, and [someone would go out] and crank the gain up again. It was a good lesson in how not to run a cable system."

COMMUNICATIONS PROPERTIES INC.

In the late 1960s, Stevanus served a full three-year term and finished an unexpired term as a member of the NCTA Board of Directors. He said, "In those four years, I rubbed elbows with a lot of people. I did have a lot of discussions over dinner and drinks and this kind of thing." This is where he got to know Jack Crosby and Ben Conroy, who had formed Communications Properties Inc. (CPI) and were looking for acquisitions. Stevanus said, "I recommended to Citizens Financial and Dick Johnston ... that if they wanted to expand our cable operations, I would introduce them to the CPI people."

At the 1969 NCTA convention in San Francisco, he got them together and they worked out a deal. According to Stevanus, "The transfer of stock from Tower Communications to CPI occurred in early 1971." At about the same time, CPI also acquired a group of Fred Lieberman's Telesystems properties. Stevanus said, "I was real happy, because as far as I was concerned these were some of the best people in the cable industry: the CPI people." Stevanus was the regional manager for the Ohio and Pennsylvania systems, headquartered in Coshocton. This later included several systems acquired in Kentucky and the system in Lafayette, Indiana. Crosby and Conroy managed a group of systems headquartered in Austin, Texas. Al Bloom was the regional manager for Lieberman's systems, headquartered in Philadelphia.

According to Stevanus, "CPI looked to us for a lot of things we were doing much better and more efficiently than they were." At the time of the merger, CPI was using coupon billing. Each subscriber was provided a book of coupons, one of which was to be submitted with each monthly payment, like the monthly

payments on a mortgage or loan repayment. Stevanus said, "We never used coupon billing. We always billed with a monthly postcard ... [using] an addressograph. When we merged with New Philadelphia ... we had 15,000 subscribers. ... This got to be pretty cumbersome ... so we upgraded the computer." At one point, CPI wanted all of its systems to use coupon billing, because of the money it could save. Stevanus said, "I went to some of their bigger systems that were using coupon billing and checked out the number of delinquents they had. ... We never could sell them on letting us do their computer billing. But eventually, they [CPI] had a computer and started monthly billing."

FRANCHISING

Stevanus said, "When we went into a town in those early days (1950s), usually you were welcomed with open arms. ... In all of the systems we ever built, we never paid the city a nickel. We never went in and told the city, 'We'll give you 5 percent of the gross' or anything like that. ... Some of the systems we acquired were paying the cities." He tells an interesting story about the night the franchise was granted in Ironton, Ohio. "A lady in the audience was affiliated with a parochial school. She wanted educational television, and she wanted cable. The council deliberated and then went into executive session." They called Stevanus in for further discussion. "As they were trying to decide how much to charge us for the franchise, the lady got up and said, 'You gentlemen ought to be ashamed of yourself. There are a lot of people that would like cable television. We need it here, and you want to charge them for coming in here.' " After the executive session, the council came out and granted the franchise, without any fee.

Stevanus said, "It was never fun to go before a city council, either for a rate increase or a franchise. It was not part of the work that I enjoyed." In the early 1960s, before merging with Citizens Financial and before the CPI merger, Tower Communications felt that Newark, Ohio, was the one city left in Ohio where it could bring in good signals, including ETV. Stevanus said, "We went in. There was a powerful group locally that owned the radio station, television station, and the newspaper. ... We sold the council on the idea of cable—through two council meetings." The local group stepped in and said, "We don't want this." Stevanus said, "We didn't get it." Five or six years later, Dick Johnston, who lived in Granville, a few miles west of Newark, said, "I know these fellows real well." He went on to say, "We can get a franchise, but we have to allow these people to participate." According to Stevanus, "He [Johnston] made a deal with them that they would own 80 percent of the system and we would own 20 percent, and we would furnish all the money."

By this time, CPI had become involved and were very angry about having to give up 80 percent of the ownership while paying all of the costs. It was going to be a difficult sell, so they held off building until they could use distant signals. Meanwhile, the franchise expired, and politics in the City of Newark changed. Stevanus said, "We went into the [city] council with our local buddies [the 80 percent owners]

and tried to get an extension. The council didn't want them [the local 80 percent owners] involved and refused to grant the extension. We were very happy about it." Then the council said, "You come back as Tower Communications [a CPI affiliate], and we'll give you a franchise." So they went back and prepared a proposal with a $4.95 per month service fee. But another local group, of quite prominent people, came in with a proposal for a $4.50 monthly fee. The Council awarded the franchise to Tower. The local group complained and got the issue on the ballot as a referendum in the fall election. It was defeated.

Tower Communications retained a consultant to help figure out, "What do we do now?"[3] The consultant suggested that Tower get the City Council to engage a different consulting firm to prepare appropriate franchise specifications for an invitation to bid. This would enable the council to evaluate and compare bids on the basis of the organizational structure's accountability and legality, the technical competence and experience of the principals and staff, and the adequacy of the financing plan, as well as the subscriber rate structure. Stevanus said, "So we did that. There was no other bidder. We were it. We were the only applicant." The proposal was due at City Hall at 4:00 PM on a weekday afternoon. Tower Antennas people worked all that day at their headquarters in Coshocton, thirty-five or forty miles from Newark. Everybody in the office was busy typing and assembling the proposal. They dashed into City Hall at 4:10 PM. The city solicitor and the newspaper reporter were there, waiting.

Stevanus admitted, "We were ten minutes late." The solicitor said, "As far as I'm concerned, that would be all right. But the newspaper is here. We don't want to give these local people a chance to say, 'Hey, you didn't go by the rules.' " So the council rejected the Tower Communications proposal. Several weeks later, a new deadline for submitting proposals was announced, and Tower Communications finally got the franchise for Newark. Stevanus recalled, "We started to build it in 1976. It's been very successful. We've wired Newark, Granville, and a couple of other adjacent communities. I think they have 23,000 or 24,000 subs at this point [1990]. That was my last achievement. I was so happy about that."

Claude Stevanus retired in 1977. He still has an interest in the two hardware stores. He said, "I bought a personal computer. I do some writing. I'm a tremendous basketball nut. I have written a basketball history from the time it started in our school in the early 1900s—1912, I believe. I bought some general ledger programs and do the accounting for both stores—payroll and so on. I've always been pretty heavily involved with photography. I still get a couple of trade magazines, and I keep roughly in touch with the cable industry. But I have nothing to do with it any more. It's now Times Mirror. ... I have enjoyed those twenty-five years. It's such a great business. I was glad to have been a part of it."

Some Funny Things Happened on the Way to Success

"Coshocton has always been an example of a town that really wanted a cable system," Stevanus said. One time he was called to a City Council meeting to face

some disgruntled rooftop antenna users. "One guy came in one night and said he had good reception [on his antenna]. But there was no good reception [anywhere] in Coshocton, really. He said he had good reception until we put those big antennas up on the hill. Now we were sucking all of the signals out of the air, and now he had lousy reception! ... This guy asked how much signal we had on those lines. He wanted me to say, 'a hundred thousand microvolts.' But I said, 'We have one-tenth of a volt.' That sounded like a minimal amount of signal." He didn't get anywhere with his complaint.

Then there is the story of the evangelical minister who lived in a duplex house. One side of the house had subscribed for cable service. The minister stuck a pin through the jacket of the drop cable and ran twin-lead around to his side of the house. It was common knowledge to the cable installers, and they toyed with the idea of hanging a sign on the twin-lead saying "Thou shalt not steal." Naturally, Stevanus would not allow that. So, one day, when an installer was in the basement to check the ground connection to the water pipe, he noticed a piece of twin-lead running through the floor in the minister's side of the house. Stevanus said, "He didn't go up to see where it went, but he grabbed this twin-lead and pulled it down, and—BOOM! Apparently he had pulled the television set off its stand. It fell to the floor. He said everything was quiet up there."

Stevanus said, "We always treated [our employees] well. CPI established good pension plans and insurance policies and everything. We never had any real labor trouble. All the telephone companies and electrical people were union, and they knew we weren't union, but they worked alongside of us and treated us well."

CPI acquired Fred Lieberman's system at Lafayette, Indiana, at about the same time as the Tower Communications merger. The Lafayette system, which had 22,000 subscribers at that time, also serves West Lafayette, but not Purdue University, which has its own system. Stevanus said, "The [Lafayette] manager was a guy who retired after we had [the system] for about a year. He was probably age 65." When the older man was ready to retire, Ben Conroy called Stevanus and said, "We have this guy, Dave Spangler, that we think is going to be an excellent man. I'd like to send him to you. You talk with him and see if you might want him to fill that place out there." Stevanus replied, "[Lafayette] was our biggest system, and I certainly wanted a good man. I'll talk to him." Spangler was from Uvalde, and Conroy came up to Lafayette with him.

Stevanus said, "He impressed me right away, and we put him in Lafayette. The men out there were union—the first system that we ever had that was union. It was a pretty good contingent of workers, and they were union, but the girls [in the office] were not." One night, Spangler called Stevanus at about 6:00 PM and said, "I think I'm in trouble. One of the girls in the office had been pressured by the men that they ought to be union and tried to tell them all the advantages. After work, they went over to the coffee shop, and they had a union meeting. When they came back, I fired the two that were responsible." Stevanus agreed, "Yeah, you're in trouble, Dave." CPI then called the company's labor specialist

attorney in New York about the matter. Stevanus said, "We conferred, and the lawyer confirmed the fact that Dave was in the wrong. By the time it all got straightened out, we had to take back the two girls, and we had to pay them for the four or five months they were out."

Over in Washington, Pennsylvania, manager Jim Loker had a policy that all his employees had to live in town. Stevanus said, "The men decided this was unjust, and a couple of them lived in Uniontown, twenty-five miles from Washington. So they went to the Teamsters in Pittsburgh and said they wanted to join. We called the [labor lawyer] in from New York, and he came in and negotiated [an agreement] with the Teamsters. I think there were only five men involved. But we informed them immediately that one of the things that was not negotiable was that they had to live in town if they wanted to work there. So they didn't get that, and the wage rate that they got was maybe a little bit higher, but [offset] by their union dues and everything. During this year, the manager no longer had to deal with these two guys [who had instituted the union agreement]. Well, the one guy went to work for the Uniontown cable company, and the other guy just quit. So, at the end of the year, they voted the union out."

Notes

1. *Claude Stevanus, An Oral History*, interview by Kathleen Pavelko, October 1990 (Denver: The Cable Center).
2. Purdue University, *Midwest Program on Airborne Television Instruction,* (Lafayette, Ind., 1961), LB 1044.7.M48., pp. 14–16; Minnesota Mining & Mfg. (3M), *Teaching With Video Tape,* LB 1044.7.M56 (undated), pp. 34–37; and, Mary Howard Smith, ed., *Midwest Program on Airborne Television Instruction* (New York: McGraw-Hill, 1961), LB 1044.7.M5, pp. ix–xiii.
3. Malarkey Taylor Associates Inc.

CHAPTER 12

ISRAEL "SRUKI" SWITZER

Israel "Sruki" Switzer, a Canadian citizen, is an outstanding professional engineer, consultant, and pioneer Cable TV operator. His unconventional and sometimes costly solutions to daunting political as well as technical obstacles often turned out to be economically sound, as well as creative and farsighted. Unable to obtain Canadian authorization for closed-circuit microwave, he paid for and built U.S. licensed translators for small towns in North Dakota and Montana, then received the translator signals for his CATV systems across the border in Saskatchewan and Alberta. To receive the translator signals eighty miles away at Weymouth, he designed and built a 975-foot guyed tower—probably the tallest tower ever built just to receive TV signals. His innovative fingerprints are apparent throughout Canada and the United States, as well as Europe, South America, and Asia. He developed the coherent HRC and IRC phase-locked carrier techniques for reducing distortion in Cable TV networks. He introduced and promoted the use of spectrum analysis, time domain reflectometry, and other sophisticated instrumentation techniques for improved performance. For more than a decade, he was chief engineer and vice president for engineering at McLean Hunter Cable and remains active as an outstanding engineering consultant to the cable television industry, worldwide. Sruki Switzer's story is told largely from his Oral History interview by Archer Taylor in June 1993.[1]

THE COMPLETE TRANSCRIPT OF THE ORAL HISTORY INTERVIEW

Because both the interviewer and the subject are engineers, much of the transcript of Israel "Sruki" Switzer's Oral History naturally tends to deal with technical matters. For those with a technical background in communications electronics or who participated in the growth years of cable television before the metamorphosis that began in the 1980s, a reading of the complete transcript can be a revealing experience. However, this chapter is about Switzer's unconventional approach to daunting challenges, mostly uncluttered with the technical details

provided in the complete transcript. There is no need to understand Cable TV technology to appreciate Switzer's practice of thinking "out of the box."

FAMILY BACKGROUND AND EDUCATION

Israel Switzer, known to colleagues and family as "Sruki," was born in Calgary, Alberta, Canada, in 1929. His parents were Jewish immigrants who came to Calgary in 1928 from Poland. He grew up in the Depression, in what he calls "very modest circumstances." He went to grade school and high school in Calgary but left to go to the provincial university at Edmonton in 1946. The family could not afford to send him to the "Ivy League" equivalents at the University of Toronto, or McGill University, or even to the University of British Columbia.

Switzer said, "I guess I was what today they would call a 'nerd,' in grade school and high school, with generally good marks in high school, particularly math and the sciences." In high school, he had a darkroom at home and became deeply involved in amateur photography. His goal, after high school, was to become a chemist. "I remember nearly blowing up the family kitchen," he said. "I think probably I was stewing something in acetone, or something, on a gas stove and blew the stove out, with carbon particles all over the house. I suppose it could have been worse." With the first money he earned, delivering groceries on his bicycle, he bought a thirty-volume 1939 American Encyclopedia—in red buckram. He said, "I think I probably read it from cover to cover; I still have it at home. It has a place of honor on my bookshelf."

At the university in Edmonton, Switzer worked the night shift for a street photographer, developing and printing pictures. He also worked for a banquet photographer, "who," he said, "was probably the last photographer in the world to use flash powder." As to his university studies, he said, "I wasn't nearly as hot a shot in college as I had been in high school. After my first year, I switched from chemistry to physics and then just took what they call a pass degree in physics. I graduated in 1949, just before my twentieth birthday. I went on to do some graduate work in physics." Asked why he switched from chemistry to physics, he replied, "I think it was just that I didn't find chemistry nearly as interesting. It seemed to me that chemistry was going to take more memory work than I cared to apply. Physics was closer to mathematics, with sort of a cleaner, more simple logic background than chemistry had."

Switzer's research thesis for his master's degree had the rather arcane title: "The Aerothermal Effects of Solar Ultraviolet." The joint project with the biology department investigated the effect of solar ultraviolet radiation on the population of rabbits and sparrows. Switzer said, "What I had to do was to build a very special photo-electric system for measuring, accumulating, and integrating solar ultraviolet. ... No trick at all today, but in 1950 that was a real major technical problem." Then, he said, "I used to help them [the biologists]. I was the anesthetist, and the biology grad student would then do a quick operation to remove the ovaries to see if they could correlate with the solar ultraviolet measurements. The

rabbits we could rehabilitate—sew them back up again. The sparrows we had to shoot. I remember going out and shooting sample sparrows with a little 410 shotgun. Although I had a modest stipend for lab demonstration—the usual thing for graduate students—I still had to work at photography most nights, and I never did finish my master's degree. I finished all the academic requirements, but didn't quite finish the thesis."

During the summers from 1949 until 1952, Switzer worked as a photographer at Jasper National Park. He said, "I worked for an excellent and truly great photographer. He worked for the National Film Board during the War. ... I did his darkroom work, so I got to be a very good darkroom technician in terms of the chemistry and processing of film and printing. ... For [the great photographer's] work, I did color transparencies—the chemistry and processing—but we didn't do any printing. ... His favorite camera was a Rolieflex. And I got one of his hand-me-down Rolieflexes—I think about a 1950 model—and I still have it. ... I did some camera work, but it was soon obvious to me that I was not in his class of photographic artist."

GEOPHYSICAL OIL PROSPECTING

When Switzer left the university at Edmonton in 1952, it was very early in the Canadian oil boom that was centered in Edmonton. He said, "At that time, the oil companies were hiring electrical engineering (EE) university classes wholesale. There was no trouble getting a job in the oil business, if you were so inclined. Well, not having a full master's degree, and feeling that I really had no future in academic physics, this looked pretty good. I went to work for a geophysical company called Weiss Geophysics. It was actually a South African company. The geophysics of the non-petroleum variety was pretty well understood there, because of the huge mining industry. The company had come to Canada to learn something about oil prospecting and to apply some of their classic mining geophysics to oil prospecting."

Switzer said, "I went to work for them for $401 per month. It was $401, because at the $400 level, I was subject to some kind of social security taxes or whatever, but at $401, I didn't have to pay. ... So, that was my salary at the time, and I went out and bought my first *new* car, on payments. ... We worked in shallow seismic, magnetic, and gravity techniques. So, I learned magnetometer. I learned gravity meters." The company sent him to a copper mining project in eastern Canada, which he didn't like at all. He said, "When you went into the bush for an oil company, it was first class. You had four-wheel drives. You had portable housing shelters—heated and cooled. ... If it were anywhere halfway remote, we used to work ten hours a day, twenty days straight, then take the rest of the month off. I thought that was great. I thought that was a sensible way to work in the bush. ... But for this mining thing, we lived in tents, no proper privies, even. ... You worked Monday through Friday, and then you had two days off, sitting in the bush camp twiddling your thumbs.

"Anyway, I didn't care for that," he said, "and I went back to Calgary and [in 1953] went to work for a company called United Geophysical." The company was founded and managed by Herbert Hoover Jr., son of President Hoover, and had been acquired as the geophysical subsidiary of Union Oil of California.

Continuing, he said, "Then I learned seismic. ... My main job was being the maintenance engineer on a kind of field test of the new multi-channel magnetic tape recorder." He then explains the process of seismic prospecting. "You drill a hole in the ground, maybe three- or four-inch bore, just deep enough through the overburden so that you can couple the energy of a few pounds of dynamite solidly into the ground. Then you string out these geophones, which are really low-frequency seismic sensors. You string them out maybe at 100-foot intervals for a quarter mile each way, and you have a lead from each of these pickups back into a multi-channel recorder. You explode the charge. It sends seismic waves down. You pick up the echoes.

"When I went into this, they put you through a training program," he recalled. "You worked a couple of weeks on handling the cables and the jugs, as they called the geophones, and you worked on the drilling rig to drill the holes, and you worked a couple of weeks on the shooting truck, learning to handle the dynamite. ... We could go through a ton of dynamite a day." Switzer was still single, twenty-one to twenty-two years old, and was still writing home. Once he wrote home, "Well, on Monday I start on the shooting crew." His mother quickly called back and said that she hadn't raised her boy to be fooling around with dynamite! Switzer assured his mother, "It's OK, folks. As long as I know my ass from a hole in the ground, I'll be OK."

CABLE TELEVISION WITH BEN TORCHINSKY

In 1954, Switzer took a vacation from United Geophysical and went to Saskatoon, Saskatchewan, to visit Ben Torchinsky, with whom he had been friends since childhood and through the university at Edmonton. Torchinsky had a master's degree in civil engineering. He was an assistant professor at the University of Saskatchewan and did some consulting work. His specialty was foundations. In Canada, television began in 1952. In the summer of 1954, Torchinsky was retained to design the foundation for the 600-foot tower for a new television station to be built in Saskatoon.

"We are sitting in his living room," Switzer said, "and he's working then on the foundation for this big tower. It was his personal bent to think what entrepreneurial opportunities might now be presented by television. We sat and talked about all the things that might be done, and we pretty soon dismissed the idea of retailing television sets, or fixing them, or anything as mundane as that." Then, Switzer remembered reading an article about cable television and reminisced, "Gee, this seems to make sense in my Canadian circumstances, because here is this television station [Saskatoon]. ... It's the only television station for 100 miles—actually, the nearest one [Regina] is 150 miles away. There have to be some good-sized towns

that are going to have reception problems. There are pretty severe regulatory limits on the number of television stations—we understood that already. So, this might be a good thing."

Switzer continued, "I went down to the library the next morning and retrieved this magazine. I think it was discussing the early—sort of 1949–1950 cable television experience. ... This was 1954, and I think it dealt with the Oregon systems. But anyway, we looked at this article and decided we would go into the cable television business. I quit my job with United Geophysical. Ben put up a little money. I put up some time. I was still single and started looking around for cable television opportunities."

They went first to Lethbridge, Alberta, sixty-five miles north of the U.S.-Canadian border. The nearest TV station was in Calgary, which began operation in October 1954. At 130 miles, rooftop reception in Lethbridge was not going to be very good. The idea would be to supplement it with U.S. programming from across the border. Switzer said, "My first view was that we would just go to a common carrier (telephone company) and hire a microwave circuit to bring the signals from the Channel 5 station (KFBB-TV) in Great Falls, Montana, into Canada for distribution in Lethbridge and then eventually in Calgary. Lethbridge was perhaps 10,000 to 12,000 homes at the time; Calgary would have been, in those years, maybe 25,000 to 30,000 homes." KFBB-TV began operation in March 1954.

However, common carrier service for such purpose was not available in Canada. "So," Switzer said, "I filed applications for private microwave from the border. We could get an American carrier to take [the signal] to the border, then [we could build] our own microwave system to take it on a closed-circuit basis. The advice from the lawyers at the time was that in Canada there was no regulation affecting anything that operated closed-circuit. That seemed to make, I think, sort of legal sense anywhere. I filed these applications, and I got word back through the lawyer that they were very unhappy in Ottawa [the Canadian seat of government] over this, and I had better withdraw the applications. I don't know what would have happened to me. I don't suppose they would have kneecapped me, but maybe I would have had an income tax audit or something like that."

As Switzer explained, "The government was concerned that this would seriously undermine their cultural policies. Television regulation in Canada is an instrument of cultural policy, and their concern is that they live in the shadow of the United States. They speak the same language, so how are you going to keep the Canadian culture alive unless you shelter and protect Canadian programming? ... I had found a loophole in the existing regulations. They had no grounds for denying microwave licenses for strictly closed-circuit purposes. It did not seem realistically possible to get microwave permits to relay the Great Falls TV signal. The big regulatory process would be very difficult, to start passing acts of Parliament that might have been unconstitutional anyway. They just found a practical way [to block it]."

Nevertheless, Switzer and his friend decided to go ahead with the Lethbridge system anyway, carrying just the Calgary signal. They found a potential headend site and were preparing to build a ten-mile cable run into Lethbridge. Then they learned that a new station was scheduled to begin operation in Lethbridge in 1955, rebroadcasting the programs of the Calgary station. "So that," Switzer said, "shot down our plan for Lethbridge, although we did come back later and did Lethbridge in 1964."

They started looking for another place and settled on Prince Albert, Saskatchewan. Switzer said, "Prince Albert is about sixty miles north of Saskatoon ... a city of about 8,000 to 10,000 homes. ... It is in a river valley, about 150 feet, I guess, down from the plain, down into the river valley, and that's where most everybody lived. It wasn't as big as Lethbridge, but it would do, and we could put a 100-foot tower on the south bank of the river, toward Saskatoon, run a cable down into the valley, and build a cable system. That's what we did."

In the summer of 1955, Switzer and his wife, Phyllis, were married. They spent their honeymoon working on the layout and design of the system. They moved to Prince Albert in the fall, to build their first cable television system. He said, "We built it over that winter and in the spring of 1956, then turned on our first subscriber. ... [They were] terribly cold winters in Prince Albert, as you can imagine that far north. ... I was climbing poles myself and up the tower. I did it substantially single-handed. I had one helper to do the mechanics. I think we had the telephone company actually string the cable, but we had to mount the amplifiers and that kind of thing. We went through some of the franchising hassles that we later learned all about in the United States. We ended up having to take local partners, because of their local political influence. We had the local radio station for a partner. We had local aldermen, or something like that. But that was OK. It turned out OK."

So they built this broadband network for carrying one channel. Switzer said, "I suppose that it was probably extravagant at the time, but I thought it prudent to build for multi-channel, because sooner or later we were going to have more channels." They used Spencer-Kennedy Laboratories (SKL) chain amplifiers, with bandwidth extended to include all channels, 2 to 13. It was an amplifier that had been adapted from wartime [radar] amplifiers, using twelve 6AK5-type vacuum tubes. They also used the SKL directional coupler taps, based on resonant transmission lines. He said, "We had some whopping big trunk cable. It was solid dielectric Amphenol, K-14 [more than an inch in diameter and very stiff]. Alex Dworkin, who was a Jerrold rep at the time, found an old K-14 connector for me. ... For smaller cable, we used war surplus RG-11/U [coaxial cable]. I mean literally, war surplus. ... We did add a second channel and that was a closed-circuit film channel. We ran our own little film chain and bought movies for it—just to add something to it. We'd run one movie, three nights a week, which I had to run because we didn't have any big staff for it."

After his mother passed away, they found among her belongings a letter Switzer had written to her when he hooked up his first subscriber in the early spring of 1956. "It works!" he wrote, "The system works! Here is somebody willing to pay us for it, and that was a momentous day! This is my first actual cable subscriber!" Phyllis and Sruki lived in Prince Albert for about a year. He said, "I forget the exact subscriber count, but we were quite happy with it, as a business. Later, our partner decided to build his own radio station, and eventually we sold [the cable system] to him. ... It wasn't a bad experience overall in the Cable TV business. I learned a whole lot in having built it." During that winter in Prince Albert (1955–1956), he found time to take flying lessons, on skis. He got his pilot's license in the spring of 1956. He still does a great deal of flying, including occasional transatlantic flights to Israel and elsewhere.

BACK TO GEOPHYSICAL PROSPECTING AND COMPUTERS

Then, in 1956, Switzer got back into geophysical work, in the major office of United Geophysical in Calgary. This time, he was analyzing data from geophysical measurements logged in a new technique developed by United, called *sonic well-logging*, based on measuring the velocity of sound in the well. Switzer described the process. "A longish pole, maybe ten feet long, [is lowered down the hole]. It has an electrically driven hammer that would make a *ping* at one end, and you would pick it up [at the other end] so you could measure the velocity of the sound in this formation over a six- to ten-foot interval. ... It was thought that this might also be helpful to geologists.

"It is 1957," Switzer said, "and I'm trying to do Fourier analyses on a whole bunch of data, and the only computer system I have available is a sort of punch card arrangement. ... It could take you weeks to do anything, if you did it at all. I think we did it once, and then said, 'This will never work.' " He answered an ad in an EE journal for a new product called an *electronic computer*, manufactured by Librascope and marketed by Royal McBee (formerly Royal Typewriter). The Royal McBee salesman who called on Switzer in Calgary actually knew very little about it. However, he thought there might be a good prospect for it in western Canada, with all the oil boom activity. Librascope offered to send Switzer to a training course in Los Angeles, if he could get two weeks off to do it. He said, "So, I did. I took their course, to learn their computer very thoroughly and get hands-on experience with it. I decided that really we should have one. ... This was a desk-sized machine. ... The flip-flops were vacuum tubes. ... The logic board was about a thousand discrete dials, but the logic behind it was very thorough. I learned Boolian algebra and the operational equations. It was what we now would call *reduced instruction set (RIS)* ... It had a 4K (kilobyte) magnetic drum and sold for $32,000—in 1957, if you can imagine! Compared to other equipment available, it was considered pretty good."

When Switzer got back to Calgary from the training course in Los Angeles, he said, "I found I had been fired. ... [Herbert Hoover Jr., president of United Geophysical] had done a leveraged buyout a few months before and bought the company

back from Union Oil Company." Switzer was annoyed when United Geophysical cancelled the usual Christmas bonuses. He said, "I didn't think that that was right—that employees should, in effect, be paying for their leveraged buyout." About that time, the president [of United Geophysical] came up to Calgary from Los Angeles. Switzer remarked to him, "Gee, I had admired the company's business acumen, in that they had allowed me to [take the training course], and I had hoped that some of it had rubbed off on me when I shook [your] hand." Hoover didn't like that remark.

Switzer then went to work for Royal McBee in Edmonton. He said, "I was their principal Canadian computer salesman, system analyst, trainer—a one-man operation. ... For the next two years, I did all of their computer work. I replaced about six or eight machines in western Canada, which was really half of all the stored-program machines in western Canada at the time. ... I sold and installed the first computer to the University of Alberta and the first computer that the University of Saskatchewan had. These were real pioneering days in electronic computers. I was on the board of directors of the Computer and Data Processing Society of Canada."

He said, "I think that it was quite obvious that Royal wasn't doing well enough in the computer business to stay in it. I could have gone with IBM, but I would have had to wear a shirt and a tie and a hat—a *white* shirt, a tie, and a hat! And I didn't want to do that. ... Fortunately, cable television came along just in time to save me from a fate worse than death—that is, having to wear a shirt, tie, and hat." By now, his old friend Ben Torchinsky had left the university and was devoting full time to consulting and building a nice sized consulting firm. In 1958, Switzer left the computer business.

CABLE TELEVISION AGAIN

Having been in Cable TV together a few years earlier, Switzer once again joined with Torchinsky, this time to build a cable television system in Estavan, Saskatchewan. Switzer and his family moved to Estavan in 1958, where his second daughter, Kira, was born. His first daughter, Jay, was born in Calgary. Estavan is in southeastern Saskatchewan, just ten miles from the North Dakota border. Switzer said, "It is 120 miles from the nearest Canadian television transmitter in Regina. It is 120 miles from Minot, North Dakota, and 80 miles from Williston, North Dakota, where the nearest American television transmitters are located. I built a 150-foot tower and could get reception from Regina. But I couldn't get anything from North Dakota, because the divide between the Missouri River drainage to the south and the Hudson Bay drainage to the north was quite a high ridge, just over the North Dakota border. This ridge was shielding us from Minot and Williston. We did not have satisfactory U.S. reception at all. But we started with this system."

He improved the reception from Regina by moving the antenna twenty miles closer. Then he installed a single hop of microwave. He said, "That was my first hands-on microwave system that I actually built. I used an old Motorola system

that I bought used from the TV station in Calgary. It had been used for a [broadcast] studio-to-transmitter link. It was a real haywire arrangement." It probably operated at 6 GHz, with 10 or 20 milliwatts, directly modulated with video on the repeller of the klystron (vacuum tube cavity oscillator). He said, "It worked periscope style,[2] because you didn't have enough power to drive [200 feet of] transmission line. I had two home-type TV towers, about twelve-inch cross-section, guyed every which way, with a bridge across the top where I hung the reflector—a pretty flimsy arrangement. I had practically no instrumentation. I'm not sure that I even had a cavity meter for checking frequency. It was a pretty 'by-guess-and-by-god' sort of thing. I guess nobody cared whether I was on frequency or not, as long as I had the receiver tuned to it. Getting all of this lined up and working was quite a job, single-handedly. But, we got it working, and it did improve our reception from Regina, and we built this system in Estavan, a community with about 2,000 homes. But we didn't think this was good enough for commercial success. I figured out then what I had to do.

"This is one of the things that I am proud of in the development of Cable TV in Canada," Switzer said. "If there were no American stations close enough to give us good reception, I would go and build one." The little farm-market village of Columbus, North Dakota, is just a few miles from the Canadian border and about twenty miles from Estavan. It lies on the northern slope of the drainage divide, and television reception is very poor because of the ridge. It was clear that the Minot station was not about to do anything about it. So, Switzer went to the folks in Columbus and said, "Hey, we will build you a translator on the ridge where we can get good reception, and I will find a site and design the antenna such that it illuminates Columbus and incidentally illuminates Estavan twenty miles further on.[3] Now, I can't hold the license, but you can." So he got the Lions Club of Columbus to apply for and hold the license. The FCC was told that the translator was being paid for by the Cable TV system in Canada. "That didn't seem to bother the FCC," Switzer said.

This was 1959. Switzer designed the tower height, geometry, and radiated power of the translator in Columbus so that it could be received in Estavan on his 150-foot tower, but not very well on ordinary rooftop antennas. "So I built that for them," he said, "and I almost got deported one time for that. And that really upset me, because here I was, doing them this big favor. There were no technicians in the area to come and check it, to tune it up periodically. Yet the border patrol were after me for working illegally in the U.S.! Anyway, this translator worked for a long, long time. We had two channels, I think, from Minot. We picked them up off the air and repeated them on two 20-watt UHF translators. That gave us two channels in Estavan, in addition to the Regina channel. Now that was a pretty good business."

In 1960, Switzer and Torchinsky decided they could now build the Weyburn system, which is about fifty miles closer than Estavan to the TV station at Regina. But it is also about fifty miles farther from the 20-watt translators at Columbus. Switzer ran the (ground elevation) profiles along pretty flat terrain, between

Weyburn and the translators at Columbus, and figured out that a 1,000-foot tower would be required to pick up the translators. "Well," Switzer said, "We did it. In the summer of 1960, I [started work on] a 975-foot guyed tower. The best site we could find, the cheapest, was a garbage dump in Weyburn." The tower was built to applicable specifications but inexpensively. An old school chum of Switzer's, who is now a structural engineer in Toronto, did the detail design of the tower, using low-cost ninety-degree angles for the structural members instead of the conventional but more expensive sixty-degree angles. Torchinsky, by now, had a structural steel firm in Saskatoon that was in the business of fabricating structural steel. His shop assembled and welded the tower sections and hauled them down to Weyburn. Switzer said, "I had a crew put it up, in February—if you can imagine! I think the overall cost was about $17,000 at the time. ... It is probably the tallest tower ever built exclusively for television reception."

Switzer put an open grid, parabolic reflector antenna on top of the tower, with a low-noise preamplifier purchased from an aerospace company. It used a General Electric, low-noise vacuum tube [of advanced design] that had to be replaced every six months or so. He said, "Eventually, I had to apply pressure through the U.S. Embassy in Canada to get spares, because they put them on some kind of restricted military list." He told the embassy that he couldn't buy them any more and wrote a letter that said, "How can any foreigner have confidence in doing business in the U.S. if you are going to cut off..." That brought him a special letter authorizing him to buy all of the GE tubes he needed.

In 1962, rapeseed was expected to become a very successful crop in northern Saskatchewan. Torchinsky had an opportunity to get into the business of building the first rapeseed crushing and processing plant, and he needed to raise some capital for it. Switzer said, "We sold a 50 percent interest in these two cable systems—Estavan and Weymouth—to the only investor we could find in Canada at that time. This was Famous Players Theaters, a wholly owned subsidiary of Paramount, [actually of] Gulf and Western—*Gulp and Devour* as they were called. ... They were willing to invest money in Cable TV, and Ben used the money to start Agri-Industries Limited, which is now a good-sized sort of conglomerate."

LETHBRIDGE AND MEDICINE HAT

In 1962, with the capital that was now available, they began to consider how they could do it again. So Switzer began looking around and soon came back to Lethbridge, where their Cable TV plans had been frustrated in 1954 by the restrictive microwave policies of the Canadian government. He said, " 'Well, if we build these translators here...' And I start looking at the map. I soon figure out that we can do the same thing at Lethbridge." The town of Shelby, Montana, is thirty-five miles from the Canadian border and about forty miles southwest of a 7,000-foot peak in the Sweetgrass Hills, called East Butte, close to the Canadian border. Switzer said, "Because the mountain had already been developed as a two-way mobile site for that area, there was a jeep trail up the mountain, and power was available. We

also had a good technician available in Shelby, who could do all the work for us." East Butte appeared to be an ideal site for a translator to deliver television primarily to Shelby. Moreover, the 20-watt translators could serve as a feed for both Lethbridge and Medicine Hat, Alberta, about 110 miles east of Lethbridge.

"And so, again," said Switzer, "we go to the Lion's Club of Shelby and [say] we will build them this translator. ... I built Lethbridge and Medicine Hat simultaneously through 1964 and 1965. I moved my family out to Lethbridge [in 1964]—our third child, Sharon, was born in Lethbridge. We lived there from 1964 through 1967, developing the Lethbridge and Medicine Hat Cable TV systems. They were built on the same principle of picking up the U.S. station from these translators on the U.S. side of the border, that we were paying for."

The systems in Estavan and Weyburn were low-band, five-channel systems (channels 2 to 6), using broadband vacuum tube equipment. Interference with the picture signal from the lower adjacent channel sound was the principal signal distortion problem. Switzer's technicians tried inverting the visual and aural carriers. While it made no difference to the monochrome TV sets at the time, it did not help the adjacent channel situation. They tried sound traps as a way to reduce the interfering aural carrier. However, because signal levels varied, the settings were unreliable. It was not until the Jerrold vacuum tube Channel Commander was introduced that it became possible to control the picture-to-sound carrier ratio adequately for adjacent channel operation. Lethbridge and Medicine Hat were built with solid-state equipment by Ameco, C-COR, and perhaps others.

SWITZER'S CONTRIBUTIONS TO CABLE TV

In July 1967, Switzer joined Fred Metcalf at McLean Hunter Cable, headquartered in Toronto, as chief engineer, later becoming vice president for engineering. He said, "Because of the association with McLean Hunter, I now had a budget. I had a shop. I had some help." He now could afford a time domain reflectometer (TDR) with which to study and compare the transmission performance of coaxial cables and connectors in the laboratory and in the field.

He once used the TDR to inspect cables in place for moisture contamination in El Cajon, California, as part of a due diligence investigation. Switzer said, "Because this system was in service and we had to [open the cables] to make the test, we had to do it in the middle of the night. I learned that when doing work at night, I always tell the police department!" He also got a little portable x-ray machine that he used to inspect splices in place, particularly when auditing work during construction. Connectors at the time were provided with a separate sleeve to be slipped between the dielectric insulation and the outer sheath of the coaxial cable to assure that it would be securely clamped and electrically bonded. Boring out the dielectric to make room for the sleeve was time consuming and a nuisance that both contractors and craftsmen like to avoid. Merely by visual inspection of a completed splice, inspectors cannot tell whether or not the sleeves are in place. Without a sleeve, the connector would look normal from the outside but could

loosen and fail in a few months. Switzer said, "I was able to x-ray them in the field after they were done. That was why the *integral sleeve* connector came along, because no one could believe the contractors.

"One of the earliest things I did," he said, "was to use aerial photography in my first design project at McLean Hunter, in 1968. We got the aerial photography company to give us recent photography, [printed] at 200 feet to the inch scale. We used the actual photograph for the base map on which the draftsman could draw directly. That worked quite well."

About 1969 or 1970, Switzer was called to investigate a case of co-channel interference to off-air reception of the local television station on Channel 10, apparently caused by the North Bay, Ontario, cable system. He said, "I found that the typical situation was in a small apartment building with a subscriber TV set connected to cable on one side and a non-subscriber with rabbit-ear antenna on the other side, separated only by about six inches of wallboard on two-by-four studs. ... The Channel 10 signal on the cable was leaking off our 300-ohm matching transformer terminal, through the wall and onto the neighbor's rabbit ears, causing a beat [interference] with his reception of Channel 10. It occurred to me that it would help a lot if we could phase lock the two Channel 10 signals.[4] But there was no catalog phase lock equipment, and I carried this idea around for a few months. Then, I happened to meet Arie Zimmerman, who was developing test equipment for the cable television division of Anaconda Astrodata." Zimmerman saw the need for phase lock and could see a market for such a product. According to Switzer, "He [Zimmerman] made very simple phase lock boxes for us that would take in Channel 10, from a little antenna at one end, and give us a CW [continuous wave, unmodulated] carrier at the other end, phase locked to the off-air Channel 10 frequency. We could use [this] to generate our own local Channel 10 [for the cable]. That did help the problem considerably. This was the first phase locking of a cable channel to a local channel."

A year or so later, McLean Hunter bought the cable system, still in its infancy, at St. Catharines, Ontario, just west of Niagara Falls, Ontario. Switzer said, "It was a tough cable market—forty miles across the lake from Toronto and twenty miles from Buffalo." They would need more than twelve channels, because of local pick-up interference on channels 2, 4, and 7 in Buffalo and channels 5 and 9 in Toronto. But the system had already been started with Jerrold equipment, with which the so-called "mid-band" channels, between low-band Channel 6 and high-band Channel 7, could not be used because of internally generated interference.

"So," Switzer said, "in response to this problem at St. Catharines, I developed the concept of harmonic carriers." In the harmonic arrangement, the visual carrier frequency for each TV channel is a precise multiple (that is, harmonic) of 6 MHz. The resulting carrier frequency is offset 1.25 MHz below the normally assigned frequency. With this arrangement, the interference is largely eliminated, and the Jerrold equipment could be used to carry as many as twenty-one channels (or more), including the mid-band.[5]

In the meantime, Arie Zimmerman and Bert Rosenbloom had started a new company called Phasecom, to build phase-locking and other headend equipment. To help them get started, McLean Hunter bought a 50 percent interest in Phasecom. Switzer said, "We got them to build us a set of headend equipment in which each channel was phase locked to an appropriate harmonic of 6 MHz." This was called the harmonically related carrier (HRC) channel assignment plan.

While testing the Phasecom headend unit, Switzer recalled, "Actual distortion measurements came out a whole lot less than we had expected, and we couldn't figure out why. It then occurred to me—literally overnight—that by manipulating the phase, we could control the peak-to-peak amplitude. So we actually then started to adjust the phase [of each of the phase-locked carriers] ... just by changing [the length] of the jumper cables between the modulators and the combining network. ... It worked quite well."

In a paper delivered to the NCTA convention in Chicago in 1974, Switzer coined the expression "phase phiddling" to identify this technique. This method for reducing distortion is described in U.S. Patent No. 3,898,566, issued August 5, 1975, to Israel Switzer, Arie Zimmerman, Lucius LaFleur, and Patrick Segrave, assigned to Phasecom Corporation. Although phase control has not been widely adopted for analog systems, the advantage of using HRC was widely adopted in the 1980s. In a modified version, designated incrementally related carriers (IRC), the *separation* between the normal visual carrier frequency assignments is phase locked to precisely 6 MHz, avoiding the 1.25 MHz offset. Switzer said, "I still believe [the harmonic system] is a useful transmission tool."

NOTES

1. *Israel "Sruki" Switzer, An Oral History,* interview by Archer S. Taylor, June 1993 (Denver: The Cable Center).
2. In the "periscope" arrangement, the parabolic "dish" antenna is located at ground level, pointed straight up toward a flat metal sheet tilted at a 45-degree angle so as to reflect the microwave beam horizontally.
3. A translator is a low-powered television transmitter (usually UHF) arranged to rebroadcast signals received over-the-air from a distant TV broadcasting station.
4. "Phase lock" is a technique for automatically adjusting the carrier frequency on the cable to precisely the same value as the Channel 10 carrier frequency received off the air.
5. W.S. Ciciora, James Farmer, and David Large, *Modern Cable Television Technology* (San Francisco: Morgan Kaufmann, 1999), pp. 317–321, 406–410.

CHAPTER 13

ARCHER S. TAYLOR

Author's note: In recounting the experiences of the early cable television pioneers, it seemed appropriate that I include my own recollections of nearly half a century in cable television. Max Paglin recorded my interview for The Cable Center Oral History Project, in five sessions over a period of eight weeks in 1987.[1] The material in this chapter is based primarily on those recorded recollections, refined and expanded as I write.

PERSONAL HISTORY

I was born in Longmont, Colorado, some thirty-five miles north of Denver, on Valentine's Day, 1916—a birthday I share with Alex Best, Henry Geller, and other notables. My father's name was Archibald. Although I was first-born, he was adamant that I should not be burdened with his name. So, "Archer" was the compromise. My father was principal of Longmont High School. In the early 1920s, the Ku Klux Klan (KKK) was actively infiltrating the state and local governments in Colorado. In 1923, they succeeded in electing a Klansman to the office of governor of Colorado. I remember clearly the time they burned a fiery cross in front of the Catholic Church a block from our house. It was scary! By 1926, the Klan had taken control of the Longmont City Council, by electing three of the five councilmen. They moved quickly to fire long-time, loyal, and conscientious city workers, running roughshod over the council minority. When they began to attack the Board of Education, my father's close friend and teacher in the high school said, "Archie, I think it's time you should join the KKK."

That was when Dad decided to go back east to Harvard and begin working toward a Ph.D. while earning his living as an employee of the Boston School Board. Thus, when I was ten years old, the family moved to Belmont, Massachusetts. Dad had completed the course work and passed the oral examination, but the research for his doctorate thesis on vocational guidance hit a brick wall glitch. With three young children in the middle of the Great Depression, he chose not to complete the project. He retired from the school board at age sixty-nine and was over eighty years old when he finally retired from independent service as a counselor.

After graduating from Belmont High School in 1933, I decided to go to Antioch College, at Yellow Springs, a small town in southwestern Ohio. The large

undeveloped woodland park along the Little Miami River particularly impressed me. This delightful natural refuge called Glen Helen was actually part of the Antioch campus, available for hiking, swimming, picnicking, or just enjoying nature. The progressive ideas of Antioch's president, Arthur Morgan, also appealed to me. The cooperative work-study program seemed an innovative approach to blending academic studies with real-world practice. Besides, part-time earnings from the co-op work assignments could not be ignored in the midst of the Depression.

I entered college with the goal of becoming an engineer. My freshman advisor, a statistical mathematician with a national reputation, suggested I consider physics as a major, rather than engineering. It was profoundly good advice. Although I have never engaged in atomic or nuclear physics, the fundamental background in mathematics and physics has proven an excellent foundation upon which to build my electronic engineering career. I graduated in 1938, with a bachelor of science degree in physics, with honors.

In 1936, I was offered a co-op assignment in the Signal Corps Radio Laboratory at Wright Field in Dayton. I had to confess that I hardly knew the difference between a vacuum tube and a light bulb, but they took me anyway, as an apprentice engineering aide. I learned fast. The project was automatic "blind" landing of aircraft. My boss, the late C.D. Barbulesco, who later became dean of the Antioch Engineering Department, liked to say that we made twenty successful automatic "hands off" landings out of twenty-two tries. "What happened to the two misses?" you ask. Well, we didn't have obstacle detection, and, in those two cases, the pilot had to take control when he noticed another aircraft on the runway.

LOUISE A. BOYD/NBS ARCTIC EXPEDITION

As graduation day approached and the job search began, an opportunity opened to work in the radio section of the National Bureau of Standards (NBS) in Washington, D.C. When I asked my physics advisor about the offer, he replied, "Well, the Bureau of Standards is a great place to be from!" It turned out to be excellent advice. It was a great experience, but I have thoroughly enjoyed my career in the private sector.

I was hired by the NBS, in 1938, as a junior physicist to assist in preparation for a scientific expedition into the Arctic, scheduled for spring of 1940. The purpose of the expedition was to collect data at high latitudes on the height and critical frequencies of the various layers of ionized gases in the upper atmosphere, called the ionosphere. Under the leadership of Theodore R. Gilliland, renowned pioneer in ionosphere studies, we constructed automatic equipment to bounce short radio pulses off the ionized layers, the vertical height of which was calculated from the time required for the pulse to travel up and return.[2] Although we would not even hear of "radar" until much later, we were actually using radar technology to obtain data about the ionosphere. Analysis of the data is fundamental to the prediction of diurnal and seasonal effects on long distance radio

transmission. Since solar radiation and magnetic fields cause the ionization in the upper atmosphere, the plan was to collect data as close to the polar regions as possible.

The genesis of the expedition was a chance conversation onboard an ocean liner on which Dr. J.H. Dellinger, chief of the radio section at NBS, was returning from a 1938 CCIR technical standards meeting in Geneva. Louise A. Boyd, a spinster whose father had made tons of money selling supplies to California gold mines, happened to be traveling home on the same vessel. Not content with high society, she had made several trips with scientific expeditions out of Norway into east Greenland, Spitsbergen, and the arctic regions. Out of that serendipitous conversation, Boyd offered to arrange for one or two NBS scientists to sail with her out of Ålesund, Norway, in the spring of 1940, on the same Norwegian arctic research vessel with which she had just spent the summer.

However, in April 1940, the Nazi Army invaded Norway and occupied the country until the end of World War II. At first, when I asked Dr. D if the expedition would be cancelled, he said, "Of course." Then he backtracked and said he would talk to Miss Boyd. Her reaction was the same, "Of course, it is now impossible." Then she also backtracked, and said, "Well, let me see if I can find an American vessel that could be chartered for this project." Sometime later, she called and said, "Yes. I have chartered Captain Robert A. Bartlett and his schooner, *Effie M. Morrissey,* for the summer of 1941." Captain Bartlett was an experienced arctic explorer associated with the National Geographic Society. He had commanded the *SS Roosevelt* in 1908–1909 and led one of the sledge parties for the Robert E. Peary attempt to reach the North Pole. Peary was hailed as a hero at the time but was recently found to have been roughly 100 miles short of the pole. The *Morrissey,* later renamed *Ernestina* by new owners, is a 106-foot, two-masted sailing schooner, built in Essex, Massachusetts, in 1884. In the 1930s, she was fitted out with a three-cylinder diesel marine motor, and her hull was covered below the waterline with a two-inch layer of tough South American greenheart sheathing to resist the enormous pressures of the arctic ice pack.

Miss Boyd was expedition director. I was one of two NBS scientists on board, along with Frederick R. Gracely, who would try to locate the north magnetic pole with a sophisticated magnetometer provided by the Carnegie Foundation. Tom Carroll was the ship's radio operator, assigned to the *Morrissey* by the U.S. Coast Guard. Because of the War in Europe, we were restricted to areas west of the southern tip of Greenland, primarily Baffin Bay, and were denied access to classified radio weather reports. We departed from Washington, D.C., in June 1941 and in August reached the refuge shelter at Etah, Greenland, on Smith Sound at seventy-eight degrees north latitude. We returned to Washington early in November 1941, scarcely a month before December 7, "the day that shall live in infamy." Needless to say, participation in the NBS–Louise A. Boyd Arctic Expedition of 1941 was the crowning experience of my lifetime.

CONSULTANCY—PAUL GODLEY—MOVE TO MONTANA

During the War, I worked briefly as transmitter operator for radio station WMAL in Washington, D.C. Then, in 1944, I took a job as radio broadcast allocations engineer with Paul Godley, a leading consulting radio engineer (broadcasting) headquartered in New Jersey. But I could not get the love of the West out of my blood. So, in 1947, with my wife and the two boys, David and Larry, I headed west to seek—not a fortune—but what I hoped would be at least a livelihood as a freelance broadcast radio and television consulting engineer. We picked Missoula, Montana, as our new home, on the strength of a friend's recommendation and Chamber of Commerce brochures. More specifically, however, the glorious mountains and warm friendly atmosphere experienced in a two-week vacation trip to "case the joint" proved irresistible. Larry and his daughter (our granddaughter) and their families are still there. Our third son, Kenneth, and our daughter, Margaret, were born in Montana.

Survival was tough. I undertook a couple of field engineering assignments on sub-contract, first for Worth Lent and later for Jim McNary, both established Washington consulting engineers. But, less than a year after I landed in Missoula, the FCC imposed its 1948 freeze on television. In those days, new and upgraded facilities for radio and television broadcasting were the lifeblood of consulting engineers. Well, everyone knew that radio was about to die (it didn't, of course) as television took its place. Radio consulting was drying up, and television was frozen. So, in order to make at least partial payments to our friendly neighborhood grocer and the service station that kept my car running and supplied with fuel and tires, I took a job as laboratory assistant in the Physics Department at the University of Montana (called Montana State University at that time).

Meanwhile, my wife LaVerne, who is a public accountant and graduate of Benjamin Franklin University in Washington, D.C., decided to enter politics and run for election as a Democrat to the open position of Missoula County auditor. She won handily and soon uncovered fiscal irregularities that eerily mirrored the vicuña coat and refrigerator scandals in Washington at about the same time. Before her first term was over, she had conducted the investigations that led to felony convictions of the county engineer and two county commissioners. She also won a mandamus ruling in the Montana Supreme Court against the county commissioners for abuse of discretion in not providing the necessary facilities to enable the Office of the Auditor to perform its constitutionally prescribed duties. She was re-elected and served four full terms as Missoula County auditor. It was an exciting time for us.

INTRODUCTION TO CATV

One of my first consulting clients in Montana was a senior engineering student at the State College in Bozeman, Montana. G. Norman Penwell (who later became the first NCTA staff director of engineering) was planning to build a radio station

in Bozeman when he graduated. He retained my help in preparing the application and conducting the field work. After he built the station, licensed as KBMN, he would call me from time to time at my office at the university, with questions or comments about the station. On one occasion, early in 1953, he called and asked what I knew about community television. I told him that I had seen the December 1952 article in *Electronics* magazine, in part about Martin Malarkey's system in Pottsville, Pennsylvania.[3] But I knew nothing more. He was intrigued by the opening of the new KXLY-TV television station on 6,000-foot Mount Spokane near Spokane, Washington, and wondered if it could be received 160 miles away in Missoula. He said, "I have some due bills from a flying service in Bozeman for advertising on KBMN. I'm planning to cash in some of these bills and charter a plane over to the coast to visit community television systems in Seattle, Bellingham, Centralia, and Chehalis, Washington, and Astoria, Oregon. Would you be interested in going with me?" I said, "Sure."

MISSOULA

As a result of that trip, we decided to see whether we could find a signal from KXLY-TV that we could use to start a community antenna television (CATV) system in Missoula. Besides Norman Penwell and myself, our little group of engineers included Norm's cousin John R. ("Jack") Penwell and my friend Bruce Hamilton. Jack also had a BSEE degree and was a licensed operator at KBMN. Although Bruce did not have an engineering degree, he was exceptionally well informed in radio and television electronics and operated a sophisticated electronic repair shop.

We found a spot on Waterworks Hill, just north of my home in Missoula, at an elevation some six or seven hundred feet above the valley floor, with a clear view toward the west. However, the propagation path from Mount Spokane is well below the horizon and completely obstructed by the range of mountains that lies between Missoula and Spokane. We set up a short mast with a long ten-element, Channel 4 Yagi antenna. We bought a portable generator to provide power and a small TV set. We used a little antenna booster to improve the signal-to-noise ratio. The TV picture we got was at least encouraging.

To protect the TV set and electric generator from the weather, we put up a little pup tent. At that time, the TV station operated for only a few hours in the evening, mostly after dark. Pretty soon, we noticed a steady stream of headlights as people from all over Missoula drove up the road past the small reservoir to see what we were up to. One day, the sheriff's office received a report that a small child was riding a tricycle up the gravel road that passes perilously close to an abandoned mine shaft on Waterworks Hill. Responding to the call, the sheriff discovered that the child was none other than our four-year old son, Kenneth, who was quite indignant and fiercely resisted arrest. He protested, "I'm just going up to my Daddy's 'televizher.' " When the sheriff finally got him aboard and started to put the tricycle in the car, Ken objected again, "But it's too dirty to put in the

car!" As county auditor, LaVerne had become quite well acquainted with the sheriff and his deputies. In fact, the sheriff's mother was a near neighbor of ours, and so we saw him quite often. No charges were filed!

This was all-volunteer, part-time work for the four of us. We kept the temporary setup for several days until we could set a telephone pole on which we could stack antennas for more gain. Then, we built a little kiosk at the bottom of the hill, with a plate glass window so that people could see the television pictures while we were making arrangements to start wiring the town.

In May of 1953, we organized Northwest Video Inc., to establish community television systems in Montana. We did not seek a franchise from the City of Missoula. We had learned that Jack Zeckman (who was reported to be involved in the Centralia and Chehalis, Washington, systems) did talk to City Commissioner John Vance, a Missoula lawyer, about a franchise. Vance is reported to have said, "We would be delighted to take your money, but you really don't need a franchise from the city. The State of Montana has a franchise agreement with the utility companies specifying the conditions under which they may place wire lines along and across city streets. We would simply ask the state to hold the utility companies responsible for assuring compliance with respect to Cable TV lines attached to their poles."

But we did contact Montana Power Company and Mountain States Telephone Company (a Bell System company) regarding attachments to their poles. The power company had no particular interest. They welcomed the additional load represented both by the Cable TV amplifiers and the home TV sets. They had a joint-use agreement with the telephone company and were comfortable with whatever they wanted to do. The telephone company was clearly reluctant and said they would get back to us.

Meanwhile, we learned that Pat Goodover, the local manager of Missoula AM radio station KXLL, also appeared to be interested in starting Cable TV in Missoula. This was surprising, since KXLL was one of the "XL" (excel!) chain of radio stations in the Pacific Northwest owned by Ed Craney, a dedicated opponent of Cable TV as a threat to "free television." Craney also owned television stations KXLF-TV in Butte, Montana, and KXLY-TV in Spokane. We were not surprised when the telephone company called to set up separate appointments, on the same day, for the purpose of negotiating pole attachment agreements with both Northwest Video and KXLL.

MOVE TO KALISPELL

Now, we had all the ingredients we needed, with one exception: investment capital. The pole attachment agreement was, in fact, the starting gun for a cable race. With our limited financial resources, we knew we could not win in the face of Ed Craney's far more substantial assets. Moving our efforts to Kalispell, 125 miles north of Missoula, was an easy decision. Although the population is only about one-third that of Missoula, Kalispell is the next largest city within potential range

of the only accessible TV station. It is a few miles closer to Mount Spokane, but both the Cabinet Range and the northern end of the Bitterroots obstruct the propagation path.

Norman, Jack, and Bruce flew in a chartered airplane to probe for the KXLY-TV signal in the vicinity of Big Mountain, about twenty miles north of Kalispell. They found a good signal at an elevation of about 6,700 feet above sea level. But we really wanted something closer to the city. So they began probing among the hills west of Kalispell. Norm said, "We got down pretty close to the top of the hills—about fifty feet, I think. I remember, on some occasions up there it was really, really bumpy. It was like driving a car directly into a six-inch curb at about forty miles an hour. It tore the batteries loose from their tie-downs, and really made a mess of things. It could get pretty rough up there."[4]

They found a signal, and crisscrossed back and forth, working their way east toward Kalispell. It became apparent that the signal was being diffracted (bent) downward over the mountain range. Norm said, "We knew, more or less, where to look for it on the ground. It turned out that we found a really hot spot right next to the highway, just north of Kalispell, on the edge of town." The signal we received was probably diffracted (or bent) over the intervening mountain ridges, due to a phenomenon called "obstacle gain," which enabled many Cable TV systems in mountain country to receive television signals far beyond the normal "smooth earth" horizon.

We bought a plot of land for the antenna. Ironically, when we sold the system fifteen years later, we discovered we had put the antenna on state land, adjacent to the plot we had purchased! We built a large "bedspring" array of horizontal dipole antennas in front of a reflective screen. At a height of about thirty feet above ground, the signal was strong enough to make a quite respectable picture. Moving the probe antenna up or down, right or left, would cause the signal to drop out. Nevertheless, with the antenna rigidly in place, the signal was remarkably stable.

Over time, however, our signal suffered from electrical impulse noise, traced to arcing at loose cross-arm braces on the 7,200-volt electrical power lines in the valley just below and directly in front of the antenna array. Mountain States Power Company (no connection with Mountain States Telephone Company), which provides both power and telephone service in Kalispell, was most helpful in tracking down and correcting the problem, but it kept recurring. We really needed to find a better site. Negotiations for pole attachments were uncomplicated, although the rate was $2.50 per pole per year, while Mountain States Telephone, part of the Bell Telephone system, charged only $1.50 in other communities.

A Serious Accident

We were just beginning to try to raise money for building the Kalispell system when I suffered a serious accident that kept me in the hospital and confined to a wheelchair for a year and a half. While employed at the University of Montana,

I designed and installed a public address system in the new University Field House. Contract steel riggers working on the building rigged a boatswain's chair so that I could connect the loudspeakers installed in the scoreboard about thirty feet above the arena floor. When I began to descend, on November 25, 1953—the day before Thanksgiving—the rig pulled apart, and I dropped in free fall to the ground, landing upright on my feet. I was badly broken, but, with an excellent medical team, I survived. They took care of the internal damage, put my spine under tension, and stabilized it with a full-length body cast. The outstanding surgeons who worked on me reconstructed my crushed heels and ankles to the remarkable condition with which I have lived for nearly fifty years. I can walk rather well, with the aid of a cane and custom shoes, and experience only occasional but quite bearable discomfort.

While I was still recuperating, in a hospital bed at home, Art Mosby retained me to complete the license application for his new television station in Missoula on Channel 13, which I did, successfully. Mosby was one of the pioneer AM radio broadcasters in Montana in the 1920s, with what was then KGVO, licensed to broadcast on 1290 kHz. Before my accident, I had done the preliminary site survey work and prepared an application for the KGVO television broadcasting construction permit. I had surveyed the mountains around Missoula for a suitable transmitter site. I studied topographic maps, examined aerial photographs stereoscopically, and inspected a number of possible but inaccessible sites from an airplane. Mosby acquired land on the unnamed peak that I had recommended, about ten miles north of Missoula. He named it "TV Mountain" and proceeded to construct the TV transmission facility. It was about 6,800 feet above sea level, overlooking the entire Missoula and Flathead valleys, and part of the Bitterroot Valley. Subsequently, a popular ski lift and associated recreational facilities, known as Snow Bowl, were developed on the side of TV Mountain near the television transmission station.

I have always believed that Art Mosby asked me to prepare his license application as an intentionally therapeutic gesture. While propped up in my hospital bed, I was able to prepare the drawings and submit the data required for the license application, subsequently granted. I am forever grateful for his thoughtfulness.

NORTHWEST VIDEO START-UP

While I was incapacitated, my associates conferred frequently with me and kept me well informed. Meanwhile, they were busy trying to find investors. Eva Penwell, Jack's mother, was a major shareholder. The Kalispell city attorney bought some shares, and we invited him to join Eva and the four of us on our board of directors. The cashier of a local bank and a number of Kalispell businessmen provided the balance of our meager capital assets. The situation was greatly exacerbated when the telephone company demanded a $25,000 performance bond which they told us was to ensure that we would clear their poles "when (not if) we went out of business!" Unhappily, we could not find anyone to write such a bond

for a business with no track record and unknown principals. We had no choice but to lock up $25,000 of our precious cash with the telephone company.

During our air-charter trip to Washington state in the spring, Norman and I met Phil Hamlin, sales engineering representative for Jerrold Northwest in Seattle, a division of Jerrold Electronics Corporation. When we attempted to place an order for equipment, we were informed that we would have to sign a service agreement to pay Jerrold $5 out of every installation fee collected, and 25 cents out of every monthly service fee. In return, Jerrold would provide engineering design and counsel and provide updated information and other benefits. Since we were talking to investors on the strength of our engineering training, background, and experience, we could hardly agree to such a contract. We tried, unsuccessfully, to find a way to circumvent the agreement. I even called Milt Shapp personally to reason with him, to no avail.

Since we could not buy Jerrold equipment, we bought three RCA Antennaplex strip amplifiers, in enormous metal cabinets. They were power hungry and hard to maintain. Then we heard about International Telemeter's wide-band amplifier, called Amplivision. Rated at 40-dB gain, we installed them with 40 dB of cable loss between amplifiers. It worked very well. But—oops!—we had neglected to make allowance for the typical performance deterioration of vacuum tubes as they age! Consequently, every three months we found ourselves replacing a dozen 6AK5s (with gold-plated grids) in every amplifier. It was killing us! Finally, we found the Blonder Tongue model MLA split-band amplifier, which was not only inexpensive at $100 but also a good performer and conservatively rated. Within a few years, Jerrold abandoned the service agreement, and we began using Jerrold equipment.

Phil Hamlin and others suggested a rate structure of $125–$150 for installations and about $3.50–$3.75 per month for service. We started at $135 installation and $3.75 monthly. They also advised that the most promising prospective customers tend to be families of "blue-collar workers." They reasoned that television is low-cost entertainment, and the cost of cable service is a good deal less than taking the family to the movies. Based on this advice, therefore, we used most of our limited capital to build a few miles of plant on the west side of town where the residents were predominantly blue-collar. It was a very hard sell. No one had a TV set, and everyone was skeptical about this Cable TV venture. After paying $350 for a TV set and $135 for a connection, they wondered, "What if Northwest Video goes out of business?" Remember, that in current dollars, this was a lot of money, roughly equivalent to perhaps $2,500 for the TV and $1,000 for installation, with a service charge equivalent to nearly $30 a month.

Then, some of our shareholders began asking, "When are you going to wire up the areas where we live? We've got the money; the folks on the other side of Main Street can't afford it." So, we actually took down the cable and amplifiers that we had already installed and moved them over to the east side. But we got even less

support over there! They didn't have TV sets, either. And they were skeptical that we would be around long enough to warrant the expense.

One day, Jack Penwell went up to the Kalispell Mercantile department store, posing as a customer, and asked to see their television sets. Pointing toward the corner of the showroom, the salesman said, "Yeah, there are a couple of TV sets over there behind the kitchenware display. They're pretty expensive, you know. And then on top of that, you have to pay $135 to get connected. I really don't know how long that TV wire group will be around. You're welcome to go over and have a look."

It was Elmer Blurp, the low-powered salesman! No wonder we couldn't sell cable service! Then, several things happened to jump-start the business. At long last, John Toole, an insurance agent in Missoula, had found a company willing to bail out our sorely needed $25,000 cash deposit with a proper bond acceptable to the telephone company. Then we learned that the $135 installation charge would not be taxed as ordinary income and could be treated as a "contribution-in-aid-of-construction." But the real key to unlocking the market was the announcement by the Conrad Bank that it would accept conditional sale contracts covering not only the purchase price of the TV set, but also the installation fee for a cable connection, without which the TV set would be of no value. It didn't hurt that an officer of the Conrad Bank was a member of our board of directors. Now we would be generating enough cash flow to support open credit accounts, so we would not have to wait until we had enough cash in hand to pick up urgently needed COD purchases.

Somewhere along the way, we heard about some Kalispell people (not investors in Northwest Video) who were planning to apply to the FCC for a permit to build a television broadcasting station on Channel 9, designated for Kalispell in the allocation table specified in the FCC Sixth Report and Order. A Kalispell attorney, Cal Robinson, contacted the NBC Station Relations Department on behalf of the Kalispell folks about the possibility of a program affiliation agreement. NBC responded by saying, "There would probably not be more than fifty- or sixty-thousand people within the service area of such a station. This is, frankly, only about half the number which is generally considered to be the minimum available audience necessary for the economic support of a television station." Then—with delicious irony—NBC suggested, "I should think that some sort of community antenna system might be much more practical and profitable."[5]

MICROWAVE

Kalispell businessmen Dick Gies and Fred Plummer, who had started a small system in Whitefish, fifteen miles north of Kalispell, decided in 1956 to extend their operations to Missoula. Although Pat Goodover had the pole attachment agreement and access to adequate financing, the system he proposed never materialized. It appears that he was unable to obtain satisfactory signals from the Spokane TV station and dropped the project, convinced that nobody else would

be able to do it. If they were to succeed, Gies and Plummer knew they would not only need a better signal from KXLY-TV on Mount Spokane, but they would also need some way to receive the other two network stations, KHQ-TV and KREM-TV, located at a much lower elevation in Spokane.

Therefore, they took part in the development of a microwave transmission site on top of 7,000-foot Big Mountain, about twenty miles north of Kalispell. Strong signals from all three Spokane stations were received on Big Mountain and relayed, by microwave, over a 106-mile path to TV Mountain, and relayed over a ten-mile link to the Cable TV office in Missoula. They made a deal with Art Mosby for permission to put the microwave relay station in the KMSO-TV (formerly KGVO-TV) transmitter building on TV Mountain in return for delivering the signal from KXLY-TV, which would also provide the CBS affiliate program feed for KMSO-TV. From a microwave power split on Big Mountain, all three Spokane signals were also relayed over a twenty-mile link to the Northwest Video cable office in Kalispell. Thus, while Gies and Plummer held the microwave license and were responsible for maintenance, Missoula Cable TV, Northwest Video, and KMSO-TV in Missoula shared the expense.

Big Mountain was a difficult site, accessible only on foot, or in winter by snowmobile and snowshoes. Later on, a popular ski lift provided easier access during the summer months. To protect the precisely oriented parabolic antennas from icing and twisting in the severe winter winds, a separate building with radio-transparent windows was erected, completely enclosing the antenna structure. On one occasion, in mid-winter, I accompanied our general manager on a helicopter flight over the microwave site. He pointed out the window and said, "See that fence post down there? The amplifier you see on top of that post, just above the snow level, is actually mounted at the top of a thirty-five-foot telephone pole!" That's a lot of snow!

The Must-Carry Rule

In 1964, Mosby sold 80 percent of KMSO-TV to Dale Moore, who thoroughly refurbished the transmission and studio facilities, and affiliated with all three networks as a "cherry picker." He also changed the call letters back to KGVO-TV to take advantage of the good image of KGVO radio. But, instead of remotely switching between network programs received by microwave on TV Mountain, Moore took his network programs off a conventional connection to the Missoula Cable TV system, using the channel selector of a conventional Conrac TV receiver for program switching. Moore then exercised his "must carry" rights on Northwest Video. But since Kalispell was well beyond the Grade B contour of the Channel 13 TV station, FCC rules required that we carry the low-power VHF translator, which converted the KGVO-TV programs received off-the-air on Channel 13 to Channel 9 for local reception.

Incredibly, KGVO-TV formally complained to the FCC that we—the Kalispell cable operators—were deliberately degrading its signal compared with the

same network delivered to our customers in Kalispell. We were appalled. We tried to explain to the FCC that the ABC, CBS, and NBC signals we delivered to our customers were necessarily better than the signals received from KGVO-TV by the VHF Channel 9 translator.

The signal we were required by FCC rules to carry was received on Big Mountain (20 miles north of Kalispell) and transmitted over a 106-mile microwave path to TV Mountain, where it was relayed over a 10-mile microwave path to Missoula CATV. It was then transmitted on coaxial cable to a conventional subscriber outlet at the KGVO-TV studio, connected to a Conrac TV demodulator (receiver) that could be tuned to select the scheduled network program. From there it was transmitted by microwave back up to TV Mountain, where it was broadcast by the KGVO-TV Channel 13 transmitter. This signal was then received 85 miles away in Kalispell, where it was received and converted to Channel 9 by a VHF translator for reception by the public, already degraded at many choke points along the way.

On the other hand, the signal we were delivering to cable customers in Kalispell was the same signal received on Big Mountain. It was then transmitted over a 20-mile path to the Northwest Video office in Kalispell, where it was distributed to customers, without encountering the many degrading choke points. It seemed obvious that there was no way the picture quality of the translator signal could conceivably equal that of the signal received directly over the single microwave path from Big Mountain. We even hired an independent consultant (George Frese) to make Polaroid waveform photos to prove that degradation occurred at many points in the convoluted transmission path over which Northwest Video had absolutely no control. The FCC denied our petition for waiver: "Not proven!"

THE NON-DUPLICATION RULE

The astonishing FCC ruling in the *Carter Mountain* (Wyoming) case was affirmed on appeal in 1963 (see chapters 2 and 4). In its 1966 Second Report and Order, the FCC extended the *Carter Mountain* restrictions to non-microwave Cable TV systems. We were now required not only to carry the signals of local stations and licensed translators, but also to "black out" any program that duplicated the scheduled program of the local facilities. I have told this story, in *Communications Engineering Digest*[6] and *Broadband Library* (formerly *The Literature Library*)[7] about how the "cherry picker" operator of KGVO-TV in Missoula outfoxed himself by demanding network program non-duplication. To comply with the KGVO-TV demand, the Missoula Cable TV operator was required by FCC rules to black out specified thirty-minute programs on the cable. Although the rule was not specific on this point, the automated non-duplication switchers developed for this purpose, and used by the Missoula cable system, were designed to switch off the designated cable channel between zero and thirty minutes after the hour or half-hour, deleting network commercials along with the program. However, KGVO-TV had sold local advertising to be inserted in place of the network commercials. But after running the local ad insert, the KGVO-TV operator was dumbfounded and utterly

bewildered when he tried to switch back to the network feed on his cable drop—it had been blacked out by the Missoula Cable TV operator as required by the FCC! He had lost his network feed—at his own request! It was only the *network commercials* that he wanted to black out, not the program itself! But that is not the way the rules were drawn.

Expansion and Sale

The Kalispell system was extended, in 1961, to Columbia Falls, some twenty miles or so to the northeast. Because the driveways were gravel, and there were few crossroads, the coaxial cable was plowed underground in the right-of-way to avoid the expense of attaching to utility poles. Northwest Video also provided funds and other assistance in return for equity in new systems, with separate headends, in Polson (sixty miles south at the mouth of Flathead Lake) and Big Fork (twenty-five miles southeast at the head of Flathead Lake).

The Big Fork antenna site was on U.S. Forest Service land, on a mountain ridge east of the town. Both signal and 120-volt ac power were carried on a coaxial cable lying on the ground through the woods. A light on the building, visible in town, served as a monitor to indicate loss of electrical power, generally caused by a break in the cable. On one occasion, inspection of the break clearly revealed teeth marks—probably of a porcupine with at least a toothache! The Kalispell system, with the Columbia Falls extension and the affiliates in Polson and Big Fork, was sold in 1968 to H&B American, later merged with TelePrompTer, acquired in turn by Tele-Communications Inc. (TCI), and currently owned by Bresnan Communications.

Television Broadcasting in Kalispell

From the beginning, I think, we believed that Cable TV was only temporary until a TV station became feasible. To deal with this, we adopted a strategy of pre-empting the Channel 9 slot allocated to Kalispell in the FCC Sixth Report and Order. Since I was familiar with FCC procedures, I prepared our application to the FCC for a construction permit. It was strictly "bare bones," based on low-cost industrial type cameras and processing equipment, a low-power transmitter and antenna system, and a minimum two hours of operation daily. As I recall, the cost of the proposed facilities was about $100,000—way below the cost of typical big city stations. I don't recall how we proposed to raise the necessary capital.

We filed the application. But, when the FCC public notices came out, we were stunned to see that another application for Channel 9 in Kalispell had been filed—on the very same day. We discovered that the other applicant was Frank Reardon, better known by his nickname, "Skinny," owner of local AM radio station KGEZ. Of course, he had substantially greater financial resources and a much stronger proposal than we did. The simultaneous filing was remarkable. We certainly had no knowledge of the KGEZ plans, and we could not figure out how KGEZ might have learned of ours. Perhaps it was just an amazing coincidence, although Reardon believed we jumped in after learning of his plans.

Norm Penwell decided to talk to Reardon and see if we might join forces. Although Reardon knew he could probably win out in the end, he was also aware that a comparative hearing at the FCC could drag out for a couple of years, at considerable expense. An agreement was reached that Northwest Video would withdraw its application in return for a 30 percent share of the company. I was to have a seat on the board of directors. At one of the first meetings of the directors, Reardon made clear that he intended to force us out of business within six months. At the time, I took this to mean that we would lose our customers when they discovered that they could get free television off the air from KGEZ-TV without paying a monthly service fee.

A more sinister interpretation became clear when Reardon attempted to water down our 30 percent share with additional investment. Reardon would not agree to any of our alternative suggestions for infusing additional funding into the operation and instead decided to shut the station down. According to Raymond G. Dilley, in his master's thesis at the University of Montana:[8]

> *On the night of April 9, 1958, Frank Reardon, in a reported state of intoxication, came to the station [KGEZ radio] and appeared on the air, telling the people of Kalispell he was no longer able to continue operations. According to Taylor, Reardon's remarks concerning cable competition were far from kind.*

My own testimony in the hearing before the Senate Commerce Committee is quoted as follows:

> *He came into the station to make some comments and instead read a vitriolic statement. I wish to heavens we had a tape of it, because I think we could have filed a damage action against him for some of the things he said. He got so vicious and so vile that some of his own staff at KGEZ finally turned him off. We heard about it later, and most people were sympathetic to us, because they felt he had been completely out of line in the comments he had made.*

A few months later, Norm Penwell arranged to operate the TV station under a management contract. He was in the process of attempting to negotiate permission to replace the Spokane commercials on the cable channels with local commercials for Kalispell merchants when the sheriff's department padlocked the station because of delinquent bills that could not be paid.

ILLEGAL BOOSTERS, "REFLECTORS," AND TRANSLATORS

A television booster consists of an antenna on high ground where a distant TV signal can be received, amplified, and fed into another antenna pointed down in the valley where the direct signal is not receivable. Although it first came to public notice in central Washington state, the idea of television boosters was too obvious not to have occurred simultaneously to amateurs and technicians elsewhere. Recognizing that this might be considered a sort of micro-power broadcast transmission for which a license might be required, operators rationalized the situation by calling

it a "reflector." Surely no one would object to just reflecting the signal down into the valley. It was low-powered and was not going where it might cause interference to anyone.

Nevertheless, it was—and is—illegal. When the engineer-in-charge at the FCC field office (the RI, or regional inspector) in Seattle first heard about this kind of operation, he felt duty-bound to check it out. Sure enough, there was a radio transmitter operating illegally up on the mountain. He located a technician who appeared to be responsible and made him shut it down. Part way down the mountain, the RI detected the illegal signal. It was back on the air. So he turned around and again shut down the transmitter. This time, however, he put a padlock on it. On the way down the mountain, he heard a gunshot, and the illegal signal was back in operation. "I don't get paid to shut down bootleg stills," he said as he quickly left the area. "This is a job for Washington to handle." A hearing was held in Wenatchee, Washington, by an FCC hearing examiner. He recommended no action against the booster, ruling that, even though technically illegal, the boosters were like unlicensed "baby buggies on the highways of commerce."[9] However, as NCTA counsel E. Stratford Smith says, even the FCC could not swallow that one and overruled him. Many of the communities that installed illegal boosters were much too small to warrant a wired distribution system. Under pressure from Congress, the FCC adopted rules that would permit such operations. Technically called "translators," they would convert the received signal to a designated UHF channel. Under certain circumstances, some VHF translators were also approved.

Financial support for these legal translators, as well as the so-called "reflectors," was often minimal at best. They were generally installed and occasionally maintained by TV repairmen as a community service or to promote sales of TV sets. When this became burdensome, the community was invited to make contributions to cover maintenance, and, in some cases, upgrading. The advertising slogan—"Don't be a square, pay your share!"—suggests how difficult this could be.

In the early days, the frontier attitude in the West resulted in some highly emotional encounters. In Plains, Montana, some sixty miles northwest of Missoula, a cable operator got so angry with the booster that he drove up on the mountain and trashed the equipment with his jeep. Then there was a licensed translator in the Rattlesnake Valley east of Missoula. Someone came along one night and stuck a pin through the braided coaxial cable, killing the signal. The next night, the operator stood watch with a rifle cradled in his arms!

In 1958, Art Mosby proudly announced that his new television station in Missoula would carry the entire baseball World Series. But on the day of the first game, a herringbone interference pattern appeared on every TV screen in Missoula. The FCC inspector was called and found a jamming device in a chicken coop, close to a translator rebroadcasting the KXLF-TV signals from Butte on the educational Channel 11 in Missoula. Mosby claimed, "They found out that it was the cable company that was doing it."[10] The primary purpose was probably to jam the Butte translator. Jamming KMSO-TV may have been inadvertent.

One day I had a visit from the RI in Seattle, a man I had come to know as a friend. He had received a report of "jamming" interference to the Rattlesnake Valley translator. He had tracked the jamming signal to its source and found a little battery operated grid-dip oscillator (a small signal generator that can be set to any desired frequency) hooked to an antenna. He knew I was in cable. He came to my office at the university and asked, "What do you know about this thing?" I said, "I sure don't know very much. I can do some surmising, some guessing, but I don't have any real knowledge." The RI said, "Well, I have pretty well established that this guy was a plumber who put it up there." The manager of the Missoula Cable TV system had built a little independently owned and operated cable system in the Rattlesnake Valley, using the Missoula Cable signals by arrangement with Dick Gies and Fred Plummer. Whether the RI was making a pun, I honestly do not know. In any event, no citations were issued and the grid-dip oscillator disappeared.

BOZEMAN

In 1954, while I was still incapacitated, Norm and Jack Penwell, along with Bruce Hamilton, went on to build systems in Bozeman and Livingston. Although I was not able to take part directly, I was a passive participant in these ventures. While I was kept informed at the time, the story of these developments, as told by Norm Penwell, is based mostly on an interview that I recorded in 1992.[11]

Penwell had probed for an antenna site in Bozeman, late in 1953 when Ed Craney's KXLF-TV first came on the air. He found a signal underneath the big "M," for Montana State College, on the side of Mount Baldy, northeast of the city. He said:

> *There was a little depression that evidently had somewhat the shape of a parabola or something. It seemed to concentrate the signal, and we picked up a fairly good Butte signal on four side-by-side Yagi antennas. It didn't seem to help to stack them [vertically]. We took one Yagi and lifted it up and down. As the antenna got higher up, the signal would fade out. So we just used four side by side, and then we brought that [signal] about three miles into town on a four-inch spaced ladder line [balanced open wire line]. ... It worked pretty well, except that when it rained or snowed, it just really produced a lot of ghosts. That got us started, anyway. Then, later on, we put these antennas down on Mandeville's ranch, which was next to the radio station [KBMN east of town], on North Seventh Street. We got a pretty good signal from Great Falls [KFBB-TV] when we switched to that [site].*

They had to load the antennas and other equipment on pack horses for transporting up the side of the mountain to the site. The Yagi antennas were folded, so they could be packed in a long box, probably ten feet long. Penwell said:

> *The box was tied on the horse lengthwise. You know how a horse will sometimes raise his head up and down. Well, he evidently raised too high and hit the box pretty hard, and it rattled things around and hit his rump at the same time!*

The horses spooked about halfway up and we lost all of our load. It all came loose, and the stuff was scattered all over the mountainside!

Then, they found they could receive signals on Channel 3 from Idaho Falls at a site up Cherry Creek, about thirty miles southwest of Bozeman. They applied for microwave to relay the signal down to Bozeman, hoping to put it in operation in time for the 1956 election returns. However, the FCC permit did not come in time. Nevertheless, Penwell said:

We got all the equipment and materials up to the site and built a cement block building, about ten feet square inside, in December. The weather really turned cold. We had to heat the water and had to heat the sand and had to heat the blocks. We put a lot of chemicals in so it would dry out. Of course, it wouldn't dry out, and it wouldn't cure. [The mason] said, "Don't worry about it. When it rains in the spring, it will cure in real good." And it did.

Since they had missed the election night programs, they wanted to get it working for the New Year's Day Rose Bowl football game. Penwell said, "We didn't have all our equipment up there yet, so we took a TV set and picked up the Idaho Falls signal. Then we had a little rig where we modulated the signal onto a Channel 13 oscillator (with an 807 pentode vacuum tube), cranked it up to about 1 watt, and broadcast it down with a Yagi antenna. We picked it up on Channel 13 downtown [in Bozeman] and put it on the cable. At least they had the Rose Bowl that year. It was another three or four weeks before we got the microwave in operation." This was a couple of years after they started the Bozeman system, and they had a lot of customers.

Norm Penwell had the controlling interest in the Bozeman Cable TV system as well as in KBMN. He sold the radio station to Dale Moore, who later went on to acquire the Missoula Channel 13 television station KMSO-TV. The Bozeman CATV system was sold, at about the same time, to Larry Paey, from Wyoming. Tragically, less than a month after purchasing the system, Paey was killed in the crash of a small aircraft he was piloting. The Paey estate then sold the Bozeman Cable TV system to Bob Magness, who had just started his first venture in cable television in Memphis, Texas. Norman Penwell said that Moore had evidently been managing the Paey estate. Although few criteria existed in the late 1950s for evaluating CATV properties, it has been rumored that Magness probably acquired the Bozeman system at a bargain price. Anyway, Magness moved to Bozeman to begin the expansion and acquisition of cable television properties that ultimately would become TCI, subsequently acquired by Bresnan Communications.

LIVINGSTON

Then, Penwell said:

We went over to Livingston. Actually, we got Livingston going before Bozeman because we couldn't get [a really good] Butte signal in Bozeman, but we could get [a good] Billings signal in Livingston. So we located this place up on the bluff

about five miles out of town to the north, a little bit west. We put up a big rhombic antenna, ten wavelengths on a side. In order to broadband it, we used three wires, spread at the middle poles. Then we built open wire transmission line, putting in poles every 150 feet. The wires were spaced about twelve inches, each consisting of two strands of copper wire [wrapped] around a core of No. 8 copper-weld. I guess we put them on glass knobs. ... We sent power from Livingston up that same [open wire line] to the top and used that to power the headend equipment. I had gotten a couple of low-power distribution transformers from Montana Power Company and used them backwards. I think it was about 1,200 volts, or something like that.[12]

One of the customers hooked to the Livingston CATV system as it was being constructed was Paul McAdam, owner and operator of the local AM radio station. Norm Penwell had at one time worked for McAdam as a licensed radio operator, and McAdam had once retained me for some consulting engineering service. Although our group had already started up in Livingston and was making pretty good headway, McAdam decided he wanted to get in the business. Phil Hamlin came over from Seattle on behalf of Jerrold, and located a signal about three miles east of town. Hamlin brought the signal into town on buried K-14, low-loss coaxial cable, on a sub-band channel at low frequency, something like 6 to 12 MHz.

In Penwell's words:

We had a better picture, and so we were doing pretty well. We were selling for $125 installation and $3.50 a month service fee. So, McAdam came on, and it was $100 installation and $3.50 a month. So, we met that, and then he went to $75. We met that and then he went to $25. We met that and then he went to no installation. We met that. Then he went to no installation charge and six months' free service! So then, we threw in the towel. He had us. We gave up. We made the deal. He bought our subscribers. It was our responsibility to tear down all our wires and everything. With the money we got from him, I paid back all the money that anybody had invested in it, which was more than anybody else had ever done, except for Teddy Roosevelt ... when he got in trouble out in the Little Missouri. Then—to cap it all off—the goddamn IRS wouldn't let me deduct it as a business expense, because they said I wasn't legally required to refund it!

ANTI-TRUST COMPLAINT AGAINST JERROLD

One day, while they were working on the Livingston system, Norm Penwell, Bruce Hamilton, Norm's brother Kenny, and Mark Hampton, who worked for Norm in the Bozeman cable and radio station, met in a coffee shop with Hamlin. Kenny had been setting poles for the five-mile open wire transmission line down into Livingston. Many of these poles had to be set in holes blasted through rock and frozen ground. Norm Penwell told the story:

It was when we had just started up—so that would have been in 1953. This was before Paul McAdam had decided to get into the business. Phil Hamlin said,

"If you don't buy all Jerrold equipment, then we'll bring somebody else in that will. We can get financial backing from New York investment bankers," and he mentioned Goldman Sachs, Fox Wells, and Jock Whitney, with whom Milton J. Shapp had an arrangement for financing new builds that use Jerrold equipment.

As I heard the story later, second-hand, Penwell and Hamlin began yelling at each other, in the coffee shop. It was a particularly hostile confrontation. When he got home that night, Penwell said:

I got to thinking that over, and of course I was a little bit angry. So I sent a telegram to Herbert Brownell, who at that time was U.S. attorney general. I asked him to investigate what I considered to be a violation of the Sherman Anti-Trust Act. Then, to make sure that I got plenty of publicity, I sent a copy of this telegram to AP, UP, and, I think it was INS, and to each of our [Montana] congressmen and senators. Which made a total of seven copies besides the one to Brownell. So, Jerrold sued us for corporate libel and slander—for a million dollars!

Penwell went to his attorney, Hjalmer Lando, who at the time was chairman of the Montana State Democratic Committee. After discussing the case with Jerrold's attorneys, Lando advised that Penwell had better sign a retraction. "Because," he said, "they will nickel and dime you to death, and they will win." In the meantime, however, Brownell had sent the FBI out to take depositions. Penwell told them what Lando had said. Then the FBI agent said, "Well, go ahead and sign the retraction. You've told us all about this, and a retraction isn't going to make any difference." So Penwell signed the retraction, on the basis that Jerrold would withdraw the suit, which it did. Penwell said:

Of course, Hamlin had done this to other people out in the Northwest. The FBI was out taking depositions from some of the others. One in particular I remember is the fellow who ran the system at Pasco, Washington. I talked to him several times on the telephone. It was in 1953 when the FBI was taking depositions. That seemed to be the end of it. I didn't hear anything from them. Meanwhile, I sold the radio station and moved up to Whitefish [fifteen miles north of Kalispell] and then to Arizona for the winter. I didn't hear anything until the fall of 1959, when we were down in Arizona. As a result of my telegram, the Justice Department had initiated an anti-trust action. It was in circuit court there in Philadelphia, and they wanted me to come back and testify. They also wanted Mark Hampton, who had been at that meeting in Livingston. So the two of us went back, in the fall of 1959, and testified. Milton Shapp was there and all the lawyers. The prosecutors asked us a few questions. Then we didn't hear anything further for about another year. Then, Jerrold signed a consent decree agreeing not to employ these practices any more—a real heavy slap on the wrist! ... Meanwhile, the fellow in Pasco had also been called back to testify. I don't remember how it happened, but he got treble damages—I don't know—over a million dollars,

something like that! Hjalmer Lando didn't ever mention anything like that to me, and I was too dumb to...

Charlie Clements, in his Oral History interview (see Chapter 7), tells about another conflict with Jerrold in the early 1950s. "I was working with Jim Wallace, who had KPQ in Wenatchee, and Rogan Jones, who had KVOS in Bellingham. They built a cable system [in Wenatchee] and were relying on Jerrold to supply the electronics and cable. Jerrold started overbuilding KPQ in Wenatchee. That was my first conflict with Shapp. Jim Wallace eventually sued Jerrold and got a treble damage judgment." Presumably this is what Penwell was talking about, recalling incorrectly that it was Pasco. It is perhaps not surprising that, even after Penwell became NCTA director of engineering, Milt Shapp would not speak to him when they met at the national convention.

POSTSCRIPT

Stan Searle selected me for the first, or charter, group of Cable TV Pioneers. I served a total of five years on the NCTA Board of Directors and, in 1963, served as vice chairman under Fred Stevenson. As co-chairman of the NCTA Engineering Standards Committee, I suggested Penwell become the first director of engineering employed by the NCTA. I served for many years on the Engineering Committee. In the 1960s, I worked with Cox Cablevision founder, Leonard Reinsch, on a committee investigating the feasibility of providing non-television communications on CATV networks.

NOTES

1. *Archer S. Taylor, An Oral History,* interview by Max D. Paglin, July 1987 (Denver: The Cable Center).
2. T.R. Gilliland and A.S. Taylor, "Field Equipment for Ionosphere Measurements," *Journal of Research*, National Bureau of Standards 26 (May 1941), pp. 377–384.
3. John M. Carroll, "Community Antennas Bring TV to Fringe Areas," *Electronics* 25, no. 12 (December 1952): 106 ff.
4. Norman Penwell, interview by Archer S. Taylor, January 29, 1992.
5. E.B. Lyford, NBC Station Relations, letter to Cal Robinson, May 1, 1956.
6. Archer S. Taylor, "My View–Anecdotes–I," *Communications Engineering Dige*st (December 1992), p. 20.
7. Archer S. Taylor, "From the Archive–Non-Duplication and Deliberate Degradation," *The Literature Library* (Winter 1998), p. 96.
8. Raymond G. Dilley, "The Development of Television in Montana" (Master's thesis, University of Montana, 1966), p. 66.
9. *E. Stratford Smith, An Oral History,* interview by Pat Parsons, March 1986 (Denver: The Cable Center).
10. Dilley, op. cit.
11. Penwell, op. cit.
12. Earl Hickman used a similar scheme in Arizona. See Archer S. Taylor, *History Between Their Ears* (Denver: The Cable Center, 2000), p. 105.

EPILOGUE

The pioneer tales told in this book are really more about community antenna television, or CATV, than about Cable Television as we know it today. CATV involved, first and foremost, the technology of receiving television signals where simple rooftop or rabbit-ear antennas could not do the job. Pioneer entrepreneurs and system operators devoted their time, money, and effort to financing, designing, locating, and constructing antenna facilities where they could receive television signals, no matter what the program content might be. On occasion, when the local TV station was not scheduled to carry special broadcast events like the baseball World Series or the traditional Rose Bowl football game, special effort might be made, often on a one-time basis, to carry the event from a distant television station. Otherwise, operators had little interest in program content, over which they had no control anyway.

From the beginning, CATV entrepreneurs dreamed about using the enormous bandwidth available on coaxial cables for communication other than broadcast news, sports, and entertainment. They experimented with a variety of closed-circuit, non-broadcast video. They pointed a camera at the printhead of a newsroom teletypewriter, or at a weather board equipped with thermometer, barometer, anemometer, and other weather instruments, or at a tropical fish aquarium. They jury-rigged film chains or videotape machines to play movies, and even created simple studios for local amateur performances, city council meetings, or other public events. The strategy was to deliver something to subscribers that was not available over the air.

Those dreams began to materialize on Stepember 30, 1975, when Home Box Office (HBO) employed a geosynchronous satellite to deliver the closed-circuit heavyweight prize fight program from the Philippines—Muhammad Ali's "Thrilla in Manila"—to CATV systems in Florida and Mississippi. This opened the door to cable movies and literally hundreds of satellite video networks. Today, there are cable channels especially for kids and teens. On cable, fans can see lacrosse, rugby, and other sports not covered by the networks. At least two channels are provided by the Cable Satellite Public Affairs Network (CSPAN) for public affairs, book reviews, and political discourse, including congressional debates and hearings. News and financial data from diverse sources and viewpoints are available on cable twenty-four hours a day, seven days a week. Documentaries, classic movies, history, and continuous weather information are provided on several channels. For an additional premium fee, a multitude of current and classic movies and special events are also continuously available, all relayed by satellite.

The genius of Cable TV lies in the profuse variety of programming alternatives to the traditional over-the-air television broadcast network programs. No one is interested in all of the 500 or more available channels, but two-thirds or more of all TV households in the United States subscribe to cable service in order to take advantage of the enormous array of program choices offered.

While video programming still represents the primary market for Cable TV, the market for high-speed, broadband data and Internet communications is growing rapidly. High-speed fiber-optic transmission, digital video, high definition TV, and video-on-demand have transformed the CATV of the cable pioneers into the major telecommunications facility that is known today as Cable TV, or simply cable.

Notwithstanding the enormous technological advances taking place in the Cable TV industry, its eclectic video programming has acquired an arguably unfair reputation in some quarters for program content that is seen as irresponsible, indecent, or vulgar. Moreover, the intrusion of commercials into cable programming—endlessly advertising automobiles, medical remedies, and personal products—has become as distracting and annoying as in over-the-air broadcasting. These developments in Cable TV are embarrassing and disappointing to those of us who had hoped, perhaps naively, for better.

References and Bibliography

Note: The complete Oral Histories can be read at www.cablecenter.org.

Abramson, Albert. *The History of Television, 1880 to 1941.* Jefferson, N.C.: McFarland, 1987.

Bliss, Roy, An Oral History. Interview by E. Stratford Smith, October 1991. Denver: The Cable Center.

Brenner, Daniel L., and Monroe E. Price. *Cable Television and Other Nonbroadcast Video; Law and Policy.* Release #2. New York: Clark Boardman Company, May 1989.

Campbell, John G., An Oral History. Interview by Bob Dudley, May 1986. Denver: The Cable Center.

Carroll, John M. "Community Antennas Bring TV to Fringe Areas." *Electronics* 25, no. 12 (December 1952): 106–111.

Ciciora, W.S., James Farmer, and David Large. *Modern Cable Television Technology.* San Francisco: Morgan Kaufmann, 1999.

Clements, Charles E., An Oral History. Interview by David Mercer, August 1988. Denver: The Cable Center.

Conroy, Benjamin J., Jr., An Oral History. Interview by Bob Dudley, May 1987. Denver: The Cable Center.

Daniels, Bill, An Oral History—Part 1. Interview by Max D. Paglin, February 1986. Denver: The Cable Center.

Davidson, James Y. *50th Anniversary.* Cabot, Arkansas: James Y. Davidson, 1998.

Dilley, Raymond G. *The Development of Television in Montana.* Master's thesis, University of Montana, 1966.

Fink, Donald G., ed. "Community TV Antenna System." *Electronics.* 23, no. 9 (September 1950): 182.

———. "Television Antennas for Apartments." *Electronics* 20, no. 5 (May 1947): 96–102.

Froke, Marlowe, ed. *Milestones: A 50-Year Chronology of Cable Television.* Denver: The Cable Center, 1997.

Gans, Joseph S., An Oral History. Interview by E. Stratford Smith, October 1989. Denver: The Cable Center.

Geller, Henry, An Oral History. Interview by David Paglin, November 1985. Denver: The Cable Center.

Gibbs, Rafe. "Small Town Television." *Popular Mechanics* (April 1950): 114–116, 268, 270.

Gilliland, T.R., and A.S. Taylor. "Field Equipment for Ionosphere Measurements." *Journal of Research, National Bureau of Standards,* vol. 26 (May 1941): 377–384.

Inglis, Andrew F. *Behind the Tube.* Boston: Focal Press, 1990.

Kallmann, Heinz E. "Television Antenna and RF Distribution Systems for Apartment Houses." *Proc. IRE* 36 (September 1948): 1153–1160.

Lucas, E.D., Jr. "How TV Came to Panther Valley." *Radio-TV News* (March 1951).

Lyons, Eugene. *David Sarnoff.* New York: Harper, 1966.

Malarkey, Martin F., An Oral History. Interview by Kathleen B. Hom, August 1985. Denver: The Cable Center.

Minnesota Mining & Mfg. (3M). *Teaching With Video Tape.* LB 1044.7.M56. Undated.*

Parsons, L.E., An Oral History. Interview by Richard Barton, June 1986. Denver: The Cable Center.

Phillips, Mary Alice Mayer. *CATV: A History of Community Antenna Television.* Ph.D. diss., Graduate School of Northwestern University, 1972, updated by Phillips.

Purdue University. *Midwest Program on Airborne Television Instruction.* Lafayette, Ind., 1961. LB1044.7.M48.*

Randolph, Sandford F., An Oral History. Interview by Marlowe Froke, November 1987. Denver: The Cable Center.

Rudenberg, H.C., and Fitzroy Kennedy. "200-Mc Travelling Wave Chain Amplifier." *Electronics* 22, no. 12 (December 1949): 106–109.

Sample, Joseph S. Letter to author, October 23, 1961.

Schneider, Gene, An Oral History. Interview by E. Stratford Smith, April 1991. Denver: The Cable Center.

Smith, E. Stratford. "The Emergence of CATV: A Look at the Evolution of a Revolution." *Proc. IEEE* 58 (July 1970): 967–982.

——. *An Oral History.* Interview by Pat Parsons, March 1986. Denver: The Cable Center.

Smith, Mary Howard, ed. *Midwest Program on Airborne Television Instruction.* New York: McGraw-Hill, 1961. LB 1044.7.M5.*

Southwick, Thomas. "Celebrating 50 Years." *Cable World* (October 26, 1998).

Stevanus, Claude, An Oral History. Interview by Kathleen Pavelko, October 1990. Denver: The Cable Center.

* MPATI Publications are accessible at the National Public Broadcasting Archives at the University of Maryland Libraries, College Park, Maryland. Contact Karen E. King, assistant curator, at 301-405-9988.

Switzer, Israel "Sruki," An Oral History. Interview by Archer S. Taylor, June 1993. Denver: The Cable Center.

Tarlton, Robert J., An Oral History. Interview by Lorna Rasmussen, April 1993. Denver: The Cable Center.

Taylor, Archer S., An Oral History. Interview by Max D. Paglin, July 1987. Denver: The Cable Center.

——. "My View—Anecdotes—I." *Communications Engineering Digest* (December 1992).

——. "From the Archives—Non-Duplication and Deliberate Degradation." *The Literature Library* (winter 1998).

——. *History Between Their Ears.* Denver: The Cable Center, 2000.

Walson, John, An Oral History. Interview by Mary Alice Mayer (Phillips), August 1987. Denver: The Cable Center.

Warren, Albert, ed. *Television and Cable Factbook* 67. Washington, D.C.: Warren Publishing Company, 1999.

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